TIME MANAGEMENT IN ONLINE HIGHER EDUCATION COURSES

by
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A dissertation submitted to Johns Hopkins University in conformity with the requirements for the degree of Doctor of Education

Baltimore, Maryland
July 2020

Abstract

Although the online delivery format can increase access to higher education, access does not necessarily translate to success for online learners. The purpose of this study was first to assess the needs of online students, particularly those with low GPAs and those who identified as male, at a graduate school of education. Results of a needs assessment suggested that online students at the institution, and students with low GPAs and male students in particular, struggled with time management in their online courses. Therefore, the second purpose of this study was to evaluate a time management intervention at the graduate school. The intervention involved a goal setting activity and mental contrasting with implementation intentions exercises, and was evaluated using a mixed methods approach that included a quasi-experimental comparison group design. The evaluation of the intended outcomes of the intervention revealed that it did not demonstrate a significant positive relationship to time management self-efficacy, on-time submission of assessments, successful course completion, or course grades in online courses at the graduate school. For the subgroup of students with low GPAs, those who participated in the intervention outperformed, on average, students with low GPAs who were in an untreated group, but differences were not significant. Results of a process evaluation of the intervention's implementation as well as qualitative analysis of participant writing provided possible explanations for the lack of significant positive results. Those considering a similar intervention should attend to fidelity of implementation and consider testing the intervention with students with low GPAs before using it with a broader group.

Keywords: implementation intentions, goal setting, mental contrasting, online learning, self-efficacy, time management, WOOP

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Dissertation Approval Form

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Dissertation Title: TIME MANAGEMENT IN ONLINE HIGHER EDUCATION COURSES

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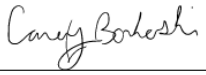
Carey Borkoski		7-26-2020
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Dedication

This dissertation is dedicated to two very important Raymonds in my life, my son and my grandfather; and to all online learners, both experienced and new.

Acknowledgements

I would like to first and foremost thank my doctoral committee, Dr. Kevin Kessler, Dr. E. Todd Brown, and Dr. Carey Borkoski. This dissertation would not have been possible without your guidance, feedback, and encouragement. It has been an honor and a pleasure to learn from each of you.

Next, this dissertation would also have been impossible without the support of my husband, Nick. Nick, thank you for your unfailing support. I am so grateful to have you as a partner.

I am also grateful for the many wonderful colleagues and students who make me passionate about continuously learning and growing as both an online student and educator. In particular, thank you to Dr. Anne-Marie Hoxie, Dr. Sarah Marder-Eppstein, and Dr. Juliette de Wolfe for your advice and encouragement throughout the doctoral process. Thank you to Dr. Shelby Keefer for sharing the wisdom that it is easier to complete a dissertation with a newborn than with a toddler.

Finally, I would like to thank my fellow Johns Hopkins Ed.D. colleagues, Brianne Roos, Alisha Couch, and Lisa Mitchell. You got me through the highs and the lows.

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Executive Summary

Despite the growth of online learning in higher education (Seaman, Allen, & Seaman, 2018) and its associated promise of increased access for students (Lee, 2017), increased access does not translate to success for all students in online courses. The purpose of this study was to support online learners, specifically those with low grade point averages (GPAs) and those who identified as male, at a graduate school of education in the United States. The study included both a needs assessment, to ensure students were getting support for context-specific needs, and an intervention evaluation. Based on a needs assessment, the intervention targeted time management skills and self-efficacy in the online learning environment as well as associated long-term outcomes (i.e., successful online course completion and grades in online courses). The following sections describe the process leading up to the design of the intervention, the intervention design, and the findings of an evaluation of the intervention.

Problem of Practice and Contributing Factors

As online learning becomes more common in higher education settings (Seaman et al, 2018), so too does the need for attention to students' learning and experiences in online courses. Overall, online students tend to perform similarly to those in face-to-face environments (Joksimović et al., 2015). However, certain subgroups of students may be disadvantaged in online courses (Bell & Federman, 2013). In particular, students with low GPAs may receive lower grades in online courses than they do in face-to-face courses (Figlio, Rush, & Yin, 2013; Xu & Jaggars, 2014), and drop out of online courses at higher rates compared to other students (Cochran, Campbell, Baker, & Leeds, 2014; Xu & Jaggars, 2014). The first purpose of this study was to understand and address the needs of students with low GPAs taking online courses at a graduate school of education.

In addition to students with low GPAs, male students may experience disadvantages in online courses because they tend to receive lower grades (Figlio et al., 2013; Xu & Jaggars, 2014), complete courses at lower rates (Cochran et al., 2014), and experience weaker sense of community (Rovai, 2002) and less positive interactions with instructors (Kuo & Belland, 2016), as compared to female students. Based on a needs assessment, described in the next section, support for both students with low GPAs and male students in online courses at the graduate school of education became a focus of the intervention and its evaluation. Factors related to instructor, course, and student characteristics may all contribute to the learning and experience of students in online courses, including students with low GPAs and male students in particular.

Instructor characteristics that are particularly important in the online learning environment include teaching presence and interactions with learners. Online instructors establish teaching presence through course design and interactions with students to guide learning (Arbaugh et al., 2008; Garrison, Anderson, & Archer, 2000). Teaching presence influences grades (Rockinson-Szapkiw, Wendt, Wighting, & Nisbet, 2016) and learning quality (Garrison & Cleveland-Innes, 2005) for online students. Learner-instructor interactions, which relate to teaching presence, also support online student satisfaction (Kuo & Belland, 2016), sense of community (Shackelford & Maxwell, 2012a), and academic success (Eom & Ashill, 2016; Jaggars & Xu, 2016). The way a course is designed can influence teaching presence (Garrison et al., 2000), and also contributes to learner-interface interactions. Learner-interface interactions, such as a student's interaction with an Internet-based learning management system, are important because they mediate all other interactions in the online learning environment (Swan, 2003).

Finally, student characteristics that may be particularly important to success in online coursework include prior online learning experience and self-efficacy for online learning.

Students who have already experienced online learning tend to have higher self-efficacy for online learning (Bradley, Browne, & Kelley, 2015; Jan, 2015; Shen, Cho, Tsai, & Marra, 2013; Zimmerman & Kulikowich, 2016), and also experience stronger outcomes relative to course completion (Cochran et al., 2014), use of learning strategies (Wang, Shannon, & Ross, 2013), and sense of community (Shackelford & Maxwell, 2012b). Self-efficacy, in turn, can drive online student satisfaction (Joo, Lim, & Kim, 2013; Shen et al., 2013), engagement (Pellas, 2014; Prior, Mazanov, Meacheam, Heaslip, & Hanson, 2016), and academic outcomes (Joo et al., 2013; Wang et al., 2013).

Context

The problem of practice and potential contributing factors described in the previous section were investigated at a nonprofit graduate school of education with multiple campuses across the United States, including an online campus. Students included in an initial needs assessment, which took place in the spring of 2018, were all enrolled at one of the graduate school's physical campuses and took at least one class online. At the time of the needs assessment, no students were yet enrolled at the online campus. Later, in the fall term of 2019, an intervention was implemented to address time management challenges associated with online learning at the graduate school. Participants in the intervention evaluation included students enrolled at physical campuses who were taking at least one class online as well as students enrolled at the online campus.

Needs Assessment

A needs assessment to determine which online learning factors (i.e., which course, instructor, or student characteristics) most related to the challenges faced by students with low GPAs at the graduate school of education was undertaken in the spring term of 2018.

Questionnaire, interview, and observation data from the needs assessment suggested that teaching presence was strong in online courses at the graduate school, students tended to perceive interactions with their instructors positively, and challenges with technology (i.e., learner-interface interaction challenges) were often minor or short-lived. Additionally, prior online learning experience did not seem to relate to online learning self-efficacy, perceptions of teaching presence, or course grades for students taking courses online at the graduate school.

However, based on data from the online learning self-efficacy scale (Zimmerman & Kulikowich, 2016), students taking online courses at the graduate school had significantly lower self-efficacy for time management in the online learning environment as compared to self-efficacy for technology use or learning online. Furthermore, time management self-efficacy in the online learning environment was significantly lower for students with undergraduate GPAs below 3.00 and for male students as compared to students with higher GPAs and female students, respectively. Interview data also supported the need for time management support among students with low GPAs. Two of the three students interviewed with undergraduate GPAs below 3.00 brought up time management as a challenge even though they were not asked about it explicitly. In contrast, none of the five students interviewed with higher GPAs described personal challenges with time management. The findings of the needs assessment therefore indicated that a time management intervention would be worthwhile at the graduate school.

Time Management Intervention

Based on the demonstrated challenges associated with time management among online learners at the graduate school of education, particularly among online learners with low GPAs and male online learners, a time management intervention was prioritized. The intervention was implemented across the fall term of 2019 and involved two key components. First, in a goal

setting activity at the beginning of the term, students reflected on a desired future and counter-vision to that future, then set three to six goals and identified strategies to achieve their goals. The activity was based off other interventions demonstrating positive results relative to GPA and retention among students with low GPAs (Morisano, Hirsh, Peterson, Pihl, & Shore, 2010) and to credits earned and retention among male students (Schippers, Scheepers, & Peterson, 2015).

Next, students engaged in four mental contrasting with implementation intentions (MCII) exercises across the term during synchronous class sessions. During an MCII exercise, participants choose a wish that is desirable, feasible, specific (Kizilcec and Cohen, 2017; Oettingen, 2012), and in the case of this intervention, related to online coursework. Participants then imagine an ideal future in which they achieve the goal, and contrast this with a counter-vision that involves an obstacle that blocks the path to goal achievement. Finally, participants create a plan to overcome their identified obstacle (Oettingen, 2012). Previous evaluations of MCII have demonstrated its effectiveness for outcomes related to time management in higher and adult education contexts, including scheduling time, class attendance, (Oettingen, Kappes, Guttenberg, & Gollwitzer, 2015), time spent studying (Saddawi-Konefka et al., 2017), perception of time management (Oettingen et al., 2015; Saddawi-Konefka et al., 2017), and course completion (Kizilcec & Cohen, 2017).

Evaluation Design

The intervention was evaluated using a convergent-parallel mixed methods design, which involves the collection and analysis of both qualitative and quantitative data (Creswell & Plano-Clark, 2018). The evaluation included both a process evaluation, or evaluation of the intervention's implementation, and an outcome evaluation, or evaluation of the intervention's intended consequences (Rossi, Lipsey, & Freeman, 2004). The process evaluation focused on

fidelity of implementation according to Dusenbury, Brannigan, Falco, and Hansen's (2003) five dimensions of fidelity: adherence, dose, quality of delivery, participant responsiveness, and program differentiation.

The outcome evaluation focused on the intervention's intended short-, medium- and long-term outcomes, and employed a quasi-experimental comparison group design within the overall convergent parallel mixed methods approach. Intended short-term outcomes related to the quality of goals and plans that participants wrote during the intervention's activities. Intended medium-term outcomes included increased time management skills and time management self-efficacy in the online learning environment. Finally, intended long-term outcomes included increased grades and rates of successful completion in online courses. The outcome evaluation also assessed findings for subgroups by undergraduate GPA and by gender because the intent of the intervention was to support students with low GPAs and male students in particular.

Findings

Outcome evaluation results indicated that the intervention may have had no positive effects on medium- and long-term outcomes, and may have negatively influenced on-time assessment completion. Specifically, multiple regression for time management self-efficacy and course grades did not reveal the intervention to be a significant predictor of these dependent variables. Similarly, a Fisher's exact test suggested there was no significant association between participating in the intervention and successful completion of online courses. Finally, a multiple regression model for on-time assessment completion suggested that participation in the intervention was a significant ($p = .038$) negative predictor for on-time assessment completion.

Evaluation of the intervention's intended medium- and long-term outcomes according to gender yielded similar results. In contrast, evaluation of these outcomes according to

undergraduate GPA revealed that participants in the intervention with undergraduate GPAs less than 3.00 performed better, on average, on all measured medium- and long-term outcomes compared to participants with low GPAs in the untreated group. None of the differences was significant, so the positive trend may have been due to chance. However, because the trend applied to all four quantitatively measured outcome variables, further study of the intervention with students with low GPAs specifically may be warranted.

The study's process evaluation can help explain the measured outcomes. The process evaluation revealed that 26% of participants received only one or two of the four planned MCII exercises and that a subset of students had insufficient time to complete MCII exercises, both of which could have limited potential positive effects of the intervention. Qualitative analysis of participants' writing during intervention activities also provided evidence that helped to explain the measured outcomes. When it came to participants' goals, although those goals written in both the goal setting activity and MCII exercises tended to be desirable and feasible, they were less frequently specific, and were unrelated to online coursework 11% to 22% of the time in MCII exercises. Similarly, participants tended to write actionable obstacles, but did not create plans that aligned to these obstacles at the same rate. Based on the theory of treatment for the intervention, issues with goal specificity (Oettingen, 2012) or the alignment of plans to obstacles (Adriaanse, Gollwitzer, De Ridder, de Wit, & Kroese, 2011) could also have minimized any potential positive effect of the intervention. Goals that were unrelated to online courses (e.g., weight loss) may have influenced participant actions (e.g., via the self-regulated learning cycle; Zimmerman, 2002), but not actions that were related to the intervention's intended outcomes. Finally, because the evaluation used a quasi-experimental design in which participants were not

randomly assigned to treated and untreated groups and had a low participation rate (32%), sample bias may have introduced error into the findings.

Conclusions

Despite the prior evidence indicating the intervention might help improve time management and associated outcomes (Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et al., 2015; Saddawi-Konefka et al., 2017; Schippers et al., 2015), findings did not indicate such an improvement among online students in this study. However, the study did illustrate the importance of process evaluation and the collection of qualitative data in the evaluation of any intervention. Process evaluation data and qualitative data in both the process and outcome evaluations provided possible explanations for the quantitative results (e.g., some participants may have received an insufficient dose of the intervention, some participants wrote non-specific goals, etc.).

Analysis of process evaluation data and qualitative data from both parts of the evaluation also revealed specific improvements that could strengthen the intervention and its evaluation for any future study. First, facilitators should provide explicit directions and feedback during MCII exercises to support participants in setting specific goals that relate to online coursework and in writing plans aligned to obstacles. Second, facilitators should remove unnecessary directions from the MCII exercises (i.e., directions having participants revisit their initial goal setting activity each time) to ensure students have sufficient time to complete the exercises and are not confused about the focus of each exercise. Third, the intervention should be feasible for facilitators to implement. For example, in this study two instructors did not facilitate all four planned MCII exercises, thus reducing the potential effectiveness of the exercises.

Given the findings of this study, practitioners may also want to consider different interventions to support time management and associated outcomes in the online environment. Alternatively, if choosing to implement an intervention like this one based on the strength of evidence from other empirical studies (Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et al., 2015; Saddawi-Konefka et al., 2017; Schippers et al., 2015), practitioners might consider testing the intervention just with students with low GPAs. Students with low GPAs tend to struggle with online coursework (Cochran et al., 2014; Figlio et al., 2013; Xu & Jaggars, 2014), and results from this study, while not significant, were somewhat more promising for this subgroup of students.

Chapter 1

Online education is a prevalent and expanding course delivery format in higher education; as of 2016, 6.4 million students had enrolled in at least one distance education course in the United States, and, although traditional higher education enrollment declined, enrollment in distance education increased (Seaman, Allen, & Seaman, 2018). In current discourse and practice, online learning and distance education are sometimes used synonymously (e.g., as by Seaman et al., 2018). But, distance education encompasses all learning that happens when students and instructors are in separate physical environments, and online learning is a type of distance education that takes place in an Internet-mediated environment (Joksimović et al., 2015; Lee, 2017).

Since the inception of Internet-mediated learning in the 1990s, many terms have been used to describe learning experiences that include online components (Joksimović et al., 2015). The extent to which courses include online components can also vary considerably. For example, some courses may include a syllabus posted online but otherwise be conducted in a face-to-face environment, whereas others may be conducted entirely without face-to-face components (Allen, Seaman, Poulin, & Straut, 2016). The operational definitions codified by Allen, Seaman, Poulin, and Straut (2016) are useful in that they account for different degrees of integration of online components in coursework. As defined by Allen et al., online courses include at least 80% of content in an online format. Blended or hybrid courses are those that include 30% to 79% of content online, web facilitated courses include 1% to 29% of content online, and traditional courses have no online content (Allen at al., 2016).

Online learning can be further differentiated according to whether it occurs synchronously or asynchronously. In an asynchronous format, students choose when to engage in

learning activities (e.g., by completing readings or contributing to an online discussion forum at times chosen by the student; Linder, 2017; Major, 2015). In a synchronous format, students must engage in learning activities at specific times (e.g., by attending a videoconference session; Linder, 2017; Major, 2016). The asynchronous format dominated online learning in its early stages, but both asynchronous and synchronous formats are used today and both can be included in the same course (Madden, Jones, & Childers, 2017; Watts, 2016).

Online education represents a major evolution in the history of distance education and has been influenced by earlier distance education and media-based learning programs (Molenda, 2008). Distance education programs in the 19th century advertised access for underresourced populations such as women and members of European racial minority groups (Lee, 2017). Whereas online learning began in the mid-1990s and expanded in recent decades (Joksimović et al., 2015; Molenda, 2008), distance education has existed since the 19th century in formats such as the correspondence course (Lee, 2017).

Online educators today use a similar "rhetorical image" (Lee, 2017, p. 17) of accessibility, meaning that online education, which originated in the mid-1990s (Joksimović et al., 2015), is promoted as providing educational opportunities for students who would not otherwise enroll in higher education coursework. In the 21st century, U.S. students who are employed, married, or have children have been more likely to enroll in online courses than other students (Ortagus, 2017). And, although students of color (i.e., students who do not identify as White) and students from low-income backgrounds (i.e., those with low annual individual or parental incomes) have been less likely to take online courses than other students, the percentages of online students who identify as students of color or as from a low-income background have increased in the 21st century (Ortagus, 2017).

Despite the expanding reach of online learning, mere access does not guarantee student persistence (i.e., course or program completion) or achievement of academic outcomes (Bell & Federman, 2013; Lee, 2017). For example, students with jobs may initially choose online coursework for its flexibility, but choose not to re-enroll in online programs due to the high time demands of their workplaces and associated time challenges related to online coursework (Choi, Lee, Jung, & Latchem, 2013). Similarly, students with low grade point averages (GPAs), male students, and students receiving loans tend to persist at lower rates in online courses as compared to other students (Cochran, Campbell, Baker, & Leeds, 2014). Students with families report family obligations as challenges to online learning (Brown, Hughes, Keppell, Hard, & Smith, 2015). Given the growth of online education and the associated promise of increased access, the extent to which access can be translated into success for different groups of students, including students with low GPAs, sometimes referred to as academically underprepared students (Bell & Federman, 2013), is of critical concern.

Problem of Practice

Although students in online courses tend to produce similar learning outcomes (e.g., as measured by student grades or assessment scores) as face-to-face courses (Joksimović et al., 2015), students with low GPAs can experience less success in online courses (Bell & Federman, 2013). Specifically, higher education students with low GPAs tend to perform worse in online courses than in face-to-face courses (Figlio, Rush, & Yin, 2013; Xu & Jaggars, 2014), and may also be less likely to complete online courses relative to students with higher GPAs (Cochran, Campbell, Baker, & Leeds, 2014; Xu & Jaggars, 2014). At a graduate school of education with multiple campuses in the United States, students with low undergraduate GPAs earned lower grades in their online courses than in their hybrid courses.

Theoretical Framework

Ecological systems theory, first developed by Bronfenbrenner (1976) to encourage psychological research in natural as opposed to laboratory settings, can be used to bring light to a variety of factors that contribute to the experiences and success of students in online courses. According to Bronfenbrenner (1994), factors influencing an individual's development should be considered across multiple levels of nested systems, specifically, across the microsystem, mesosystem, exosystem, macrosystem, and chronosystem levels. In 2013, Neal and Neal reconceived ecological systems theory as a networked rather than a nested theory. Keeping the same systems identified by Bronfenbrenner (1994), Neal and Neal viewed such systems as overlapping rather than nested. They also added the term "focal individual" (Neal & Neal, 2013, p. 723) to the theory to specify the individual upon whom the systems act. Because students with low GPAs are the focus of the problem of practice, such students can be considered focal individuals when Neal & Neal's networked ecological systems theory is applied to the problem of practice. Therefore, Neal & Neal's networked ecological systems theory will be used to organize factors that may contribute to the problem of practice.

Figure 1 illustrates three systems in networked ecological systems theory relative to a focal individual (Neal & Neal, 2013). The microsystem involves interactions between the focal individual and the immediate environment, including people in the immediate environment (Neal & Neal, 2013). Continuing with Neal and Neal's (2013) networked model, the mesosystem connects individuals in multiple microsystems. The next system, the exosystem, does not include interactions with the focal individual, but rather interactions between others who directly or indirectly interact with the focal individual (Neal & Neal, 2013). An example of an interaction in an exosystem related to online learning might be between a technology specialist and a course

designer (e.g., someone who builds the course using content from the instructor) because both of these individuals indirectly interact with an online student via the course materials or instructor.

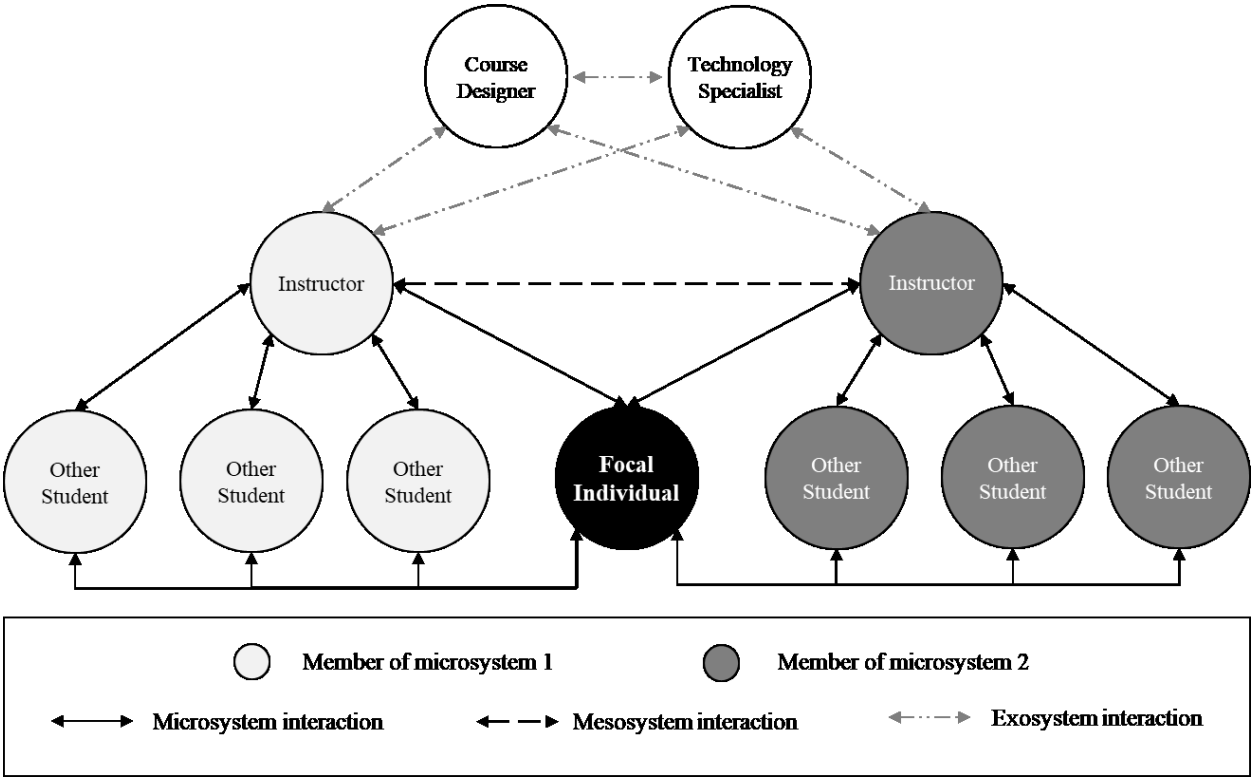

Figure 1. A focal individual and their micro, meso, and exosystems. Other microsystems for the focal individual in this example might include family & work. from "Nested or networked? Future Directions for Ecological Systems Theory" by J. W. Neal and Z. P. Neal, 2013, Social Development, 22, p. 728 Copyright 2013 by Wiley-Blackwell.

According to Neal and Neal (2013), the macrosystem and chronosystem influence interactions in microsystems, macrosystems, and exosystems and therefore impact the focal individual. The macrosystem encompasses cultural patterns and belief systems, and the chronosystem accounts for the dimension of time (Neal & Neal, 2013). For example, the interactions within (e.g., between students at the microsystem level) and surrounding (e.g., between an online course designer and technology specialist creating a course at the exosystem level) an online course are likely to evolve with time as technology evolves, which demonstrates chronosystem influence. Similarly, the microsystem, macrosystems, and exosystems related to

online learning at a specific institution would be influenced by elements of the broader macrosystem, which could include public perception of online courses and different technologies. When considered together, the various systems encompassed by ecological systems theory can provide a framework for investigating and organizing a broad array of factors that may contribute to the performance and experience of students with low GPAs in online coursework. The following sections outline the factors that contribute to the problem of practice from a networked ecological systems perspective.

Synthesis of Research Literature

Factors contributing to the experience and performance of students with low GPAs in online courses can be considered according to Neal and Neal's (2013) conception of ecological systems theory. Figure 2 shows the factors revealed in this literature review and their relationship to the different levels in Neal and Neal's ecological systems theory.

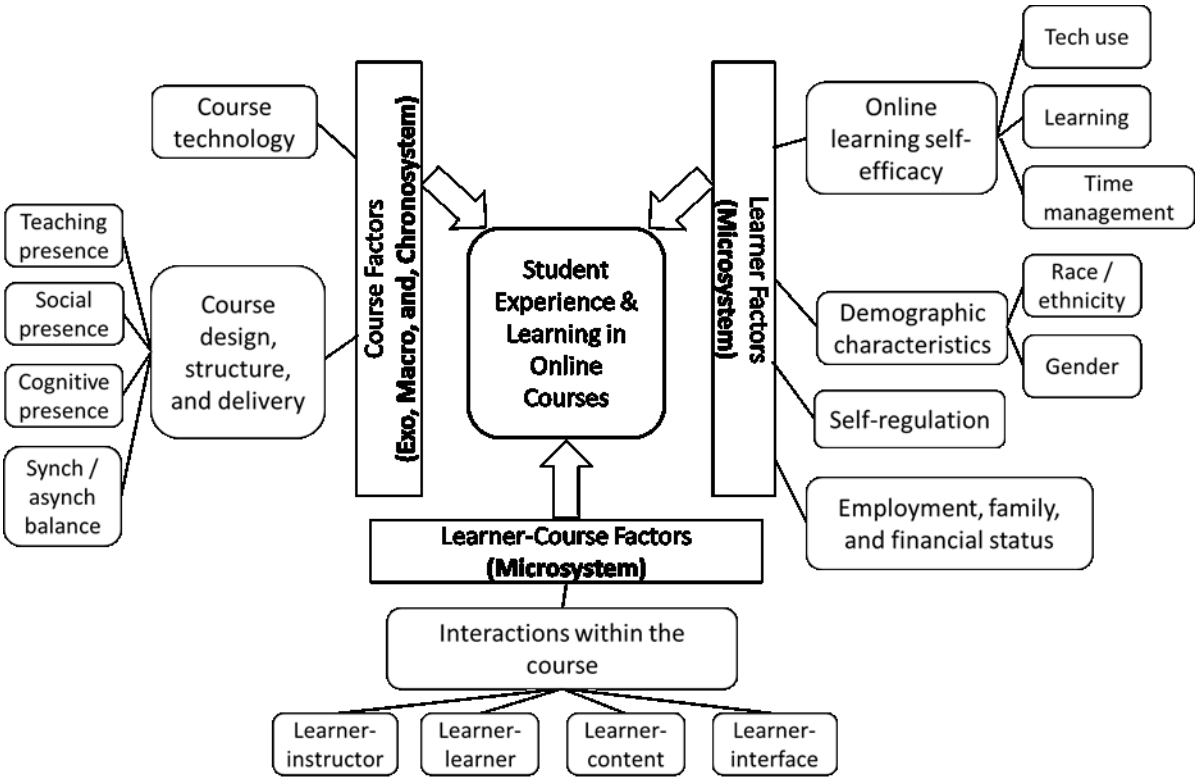

Figure 2. Factors related to the experience and learning of students in online courses.

The course factors, online learning technology and online course design and structure, relate to the exosystem, macrosystem, and chronosystem of an online learner. Learner-course factors and learner factors relate to an online learner's microsystem because they all involve the focal individual. Note that no mesosystem interactions are included in Figure 2. Mesosystem interactions are those between individuals in different environments in which the focal individual participates. From the perspective of an online student as the focal individual, an example of a mesosystem interaction might be one between the instructors of two different online courses in which the student is enrolled. Because the literature tends to focus on course factors such as design and technology and on factors involving the focal individual directly, mesosystem factors are not included in the literature review.

Course Factor: Online Learning Technology

Technology used in online courses demonstrates the influence of the broader systems (i.e., chronosystems, macrosystems, and exosystems) from ecological systems theory on online learning. For example, Clarke (2013), a member of the editorial board for the journal Technology, Pedagogy and Education, reviewed every article in two selected issues of the journal published in 1992, 2000, and 2010 to create three descriptive snapshots of themes in the published articles at each point in time. Clarke's analysis revealed a decrease in connections made within articles between technology and pedagogy over time (e.g., articles that considered the application of technologies to achieve specific educational purposes or outcomes). These findings suggest chronosystem (i.e., time-based) changes in macrosystem beliefs about the use of technology for pedagogical purposes. Specifically, online course designers, administrators, and instructors may be increasingly prone to "Everest syndrome" (Clarke, 2013, p. 125), meaning the

desire to use a new technology simply because it exists as opposed to using it for pedagogical purposes.

Online instructors may focus on technological innovation rather than pedagogical uses of technology if they assume that current students are digital natives (i.e., those who have never experienced day-to-day life without the existence of computers and the Internet) with universally high technology skills, an assumption that does not stand up to investigation, even among graduate students (Owens & Lilly, 2017). Specifically, based on the self-reported Internet skills and demographic information collected from 515 graduate students at a Maryland university, Owens and Lilly (2017) used significant difference tests to show that web-use skills varied by gender, ethnicity, and academic discipline among the surveyed participants. Course technology choices, like the choice to use a new technology simply because it exists or use a new technology without training students based on an assumption of high web-use skill, are exosystem factors because they tend to be made in environments where students are not present (e.g., settings in which technology purchasing decisions are made by administrators and instructors), but impact student experiences. Course technologies may contribute to negative student experiences or outcomes in online courses if they are complex or difficult to use (Falloon, 2012; Teo and Wong, 2013), or if they provide minimal interactivity (Huang, Chandra, DePaolo, & Simmons, 2016).

Perceptions of technological complexity and difficulty of use can contribute to negative student experiences in online courses. To learn about their perceptions of interactions and relationships in online learning, Falloon (2012) used semi-structured interviews with 22 postgraduate education students taking an online course on eTeaching at a New Zealand university in addition to a questionnaire and observations of recorded synchronous class sessions. Thematic analysis of the collected data suggested that the students perceived on-screen

technological complexity (e.g., many windows or features on a single screen) as a barrier to online learning (Falloon, 2012). Complexity has also been found to relate to learner perceptions in an online employment training context (Fleming, Becker, & Newton, 2017). In their study, Fleming, Becker, and Newton (2017) surveyed 979 employees of a rail company in Australia. Using path model analysis, the authors found that perceptions of high complexity related significantly and negatively to satisfaction and intention to take additional online courses (Fleming et al., 2017). Additionally, in a study on the influence of a variety of factors (e.g., instructor quality, technical support) on online students' satisfaction, Teo and Wong (2013) surveyed 387 undergraduate and graduate students of education at a Singapore teacher training institutes who were enrolled in a blended course on education technology. Participants were directed to take the survey with only the online portion of the course in mind. Structural equation modeling indicated that students' perceived ease of use of technology had the strongest influence on student satisfaction (Teo & Wong, 2013).

Neither Fleming, Becker, and Newton's (2017) nor Teo and Wong's (2013) research included a qualitative component to provide additional insight into what online students might consider complex or difficult to use. However, Falloon's (2012) work provided some insight, suggesting that many elements on a single screen can contribute to perceptions of complexity. All three studies (Falloon, 2012; Fleming, Becker, & Newton, 2017; Teo & Wong, 2013) support technological complexity as a factor related to the experience of students in online courses. Furthermore, Falloon and Teo and Wong conducted research with online education students as participants, making their research particularly relevant to understanding the experience of online learners at the graduate school of education at which the research outlined in the following chapters was conducted.

Technology that does not promote interaction, like complex technology, may act as a barrier to online learning. For example, a video with interactive features (i.e., embedded note-taking space, supplemental resources, and practice questions) produced significantly higher scores on a recall test than the same video without such features in a randomized controlled trial conducted with 80 graduate and undergraduate student volunteers at a Texas university (Delen, Liew, & Willson, 2014). Although the research was not conducted as part of the specific course (Delen et al., 2014), the random assignment of participants and isolation of specific interactive features provided insight into the ways course design choices can influence student learning in the online environment. Similarly, Huang, Chandra, DePaolo, and Simmons (2016) investigated the relationship between course design choices and student perceptions of transactional distance by surveying 227 online students at a university in the Midwestern United States. Correlation analysis of survey data revealed that the use of synchronous, audiovisual, or Web 2.0 media correlated to decreased perceptions of transactional distance (i.e., a sense of psychological distance in communication) when compared to communication via email or discussion forum among participants (Huang et al., 2016). Because technology choices can contribute to the learning (Delen et al., 2014), experience (Falloon, 2012; Huang et al., 2016), and satisfaction (Teo & Wong, 2013) of online students, such choices are important exosystem components to consider in online learning environments even though they do not involve the focal individual (i.e., the online learner) directly.

Course Factor: Course Design and Structure

Course design and structure are additional exosystem factors related to the problem of practice. For example, when an instructor or course designer chooses to use a synchronous or asynchronous format, the choice likely takes place in an environment where online students are

not present; however, the choice impacts the learning and experience of online students. One way of analyzing course design choices is through the community of inquiry (CoI) framework (Garrison, Anderson, and Archer, 2000), which includes teaching, social, and cognitive presence. Course design choices related to asynchronous and synchronous structures, as well as those that can be organized according to the CoI framework (Garrison et al., 2000), are considered in the following sections.

Asynchronous and synchronous course components. Asynchronous and synchronous course components both have benefits and drawbacks for online learners. In addition to findings related to course complexity summarized earlier in this chapter, Falloon (2012) found that online students described asynchronous course components (e.g., discussion forums) as best for tasks requiring reflection or deep thought. Investigation of the behavior of 22 online science education students at a public university in the United States produced a similar conclusion (Madden, Jones, & Childers, 2017). Specifically, Madden, Jones, and Childers (2017) analyzed student communication data, including asynchronous posts as well as transcripts of verbal and chat-based discussion that occurred during six synchronous web-conference meetings from one science education course. Coding and thematic analysis indicated that students used synchronous chat and asynchronous communication more frequently than synchronous verbal communication. Students tended to use synchronous chat to check in with instructors about things like course expectations, whereas they tended to use asynchronous posts for deeper reflection (Madden et al., 2017).

Although asynchronous course components may support deep reflection and thought (Falloon, 2012; Madden et al., 2017), asynchronous elements can also lead to frustration among online students. For example, Hartnett (2015) used a qualitative case study methodology to

investigate the experiences of 12 students participating in a large group project in an online course for pre-service elementary teachers at a university in New Zealand. Based on thematic analysis of data from transcripts of asynchronous online discussions and participant responses to open-ended questions in interviews and on a questionnaire, Hartnett concluded that students felt asynchronous forums were not optimal for collaborative group work. Students expressed preferences for synchronous communication for group work and described asynchronous posting requirements as slowing down their work (Hartnett, 2015). A study conducted with undergraduates taking an online educational technology course at a university in the United States produced similar results (Clark, Strudler, and Grove, 2015). Participants consisted of 16 students enrolled in the course who volunteered to participate and completed the course and a post-course survey. Of the 16 participants, six, chosen via stratified sampling, participated in standardized open-ended interviews. Constant comparison coding of the interviews indicated that participants preferred synchronous communication (i.e., videoconferencing) to asynchronous communication for group work (Clark et al., 2015).

Furthermore, synchronous components of online courses may better support learning than asynchronous components in some situations, including group work. For example, Strang (2013) randomly assigned graduate student partner pairs to collaborate either asynchronously or synchronously in an online management course at a university in Australia. Analysis of group project grades showed that partners who collaborated synchronously had significantly higher achievement than those who collaborated asynchronously (Strang, 2013). Similarly, Duncan, Kenworthy, and McNamara (2012) collected data on the quantity (i.e., number of synchronous chats and asynchronous posts) and quality of asynchronous and synchronous communication from 272 graduate students in an online accounting course at an Australian university. The

quality of communication was evaluated by the researchers on a one to six scale that corresponded to the levels of Bloom's (1956) taxonomy for learning. Quantitative analysis revealed that although both the quality and quantity of asynchronous and synchronous participation positively related to test and course grades, synchronous participation had double the impact of asynchronous participation on grades (Duncan, Kenworthy, & McNamara, 2012).

But, synchronous components of coursework include drawbacks as well; for example, synchronous course components can limit the flexibility desired by online students (e.g., ability to complete activities at chosen times; Falloon, 2012) and may not be best suited for deep individual reflection and thought (Falloon, 2012; Madden et al., 2012). Because both asynchronous and synchronous course components can serve specific beneficial purposes (e.g., Madden et al., 2017, Strang, 2013) as well as serve as barriers to learning (e.g., Falloon, 2012; Hartnett, 2015), if course design does not balance the strengths and weaknesses of the different formats or thoughtfully match asynchronous and synchronous course components to specific learning needs, course design may contribute to challenges faced by online students by limiting flexibility (Falloon, 2012) or group collaboration (Strang, 2013). Like the balance of asynchronous and synchronous components, the community of inquiry framework also relates to course design (Garrison et al., 2000).

The community of inquiry framework. The community of inquiry (CoI) framework was developed by Garrison, Anderson, and Archer (2000) to explain the different elements of an online environment that interact to produce student learning and experience in online courses that take a "collaborative constructivist" (p. 92) approach. According to Garrison et al., a course with a collaborative constructivist approach creates opportunities for learner construction of understanding due to collaboration with instructors and other learners. Because course design

and structure are critical for producing collaborative opportunities to learn, and online course design and structure are influenced by faculty, technology specialists, and instructional designers (Major, 2015), the components of the CoI framework are potential exosystem influencers on online learners.

The CoI framework consists of three types of presence: teaching, social, and cognitive (Garrison et al., 2000). Teaching presence refers to the actions taken by an instructor before (e.g., course design) and during (e.g., instruction based on course design) an online course to guide and produce learning (Arbaugh et al., 2008; Garrison et al., 2000). Learners in online courses experience the influence of teaching presence from both the exosystem level, at which course design occurs, and the microsystem level, at which interactions between the instructor and learner occurs. Social presence, like teaching presence, demonstrates the influence of both exosystem and microsystem factors on online learning. Social presence includes such elements as comfort in communicating in the online environment and feelings of belonging in an online course (Arbaugh et al., 2008).

Social presence, which may be lower in online than in face-to-face environments due to the distance between learners and instructors (Zhan & Mei, 2013), develops in online courses as a result of course design choices (e.g., welcome messages and audio usage), and instructor and learner actions (e.g., participation in discussion boards; Aragon, 2003). An early study of online learning conducted by Gunawardena and Zittle (1997) established social presence as an important construct in online courses because it explained 60% of the variance of student satisfaction with Listerv-based discussion. In their study, Gunawardena and Zittle defined social presence as the extent to which individuals could interact as “real” (p. 9) people in the online environment. The CoI framework also refers to social presence in terms of the projection of

"real" (Garrison et al., 2000, p. 94) personality online, but extends the definition to further include dimensions associated with the extent to which individuals identify with the group and the extent to which communication is open (Arbaugh et al., 2008).

The final element in the CoI framework, cognitive presence, can be seen as the culminating construct in the framework because cognitive presence refers to the construction of understanding (Garrison et al., 2000), and both teaching and social presence predict cognitive presence (Garrison, Cleveland-Innes, & Fung, 2010). Cognitive presence was originally conceived of by Garrison et al. (2000) from a course design perspective. In the CoI framework, specific designed phases of learning, such as exploration or application, produce the critical thinking necessary for a learner to develop cognitive presence (Garrison et al., 2000).

Relationships within the CoI framework. Online students' perceptions of each type of presence in the CoI framework predicts student grades (Rockinson-Szapkiw, Wendt, Wighting, & Nisbet, 2016). Consequently, the extent to which each type of presence is established in online courses likely contributes to the success of students in these courses. However, rather than existing in isolation, teaching, social, and cognitive presence are interrelated (Garrison et al., 2000). For example, a 2005 study by Garrison and Cleveland-Innes provided evidence for the relationship between teaching and cognitive presence. In the study, Garrison and Cleveland-Innes compared the course structure and instructor involvement in four asynchronous online graduate courses to data from a student survey that measured deep, superficial, and achievement approaches to learning. The survey was administered at the beginning and end of each course, and data were analyzed using two-way repeated measures analysis of variance. The single course that demonstrated an increase in students' deep learning over time, unlike the other courses studied, included a high amount of instructor involvement, characterized by actions such as

questions crafted to facilitate reflection and critical discourse (Garrison & Cleveland-Innes, 2005).

The connection between teaching and cognitive presence established by Garrison and Cleveland-Innes (2005) was corroborated by Garrison, Cleveland-Innes, and Fung's (2010) finding that students' perceptions of teaching presence in online courses, as measured by the CoI framework survey (Arbaugh et al., 2008), were predictive of their perceptions of cognitive presence. In surveying 205 graduate students in the education and interdisciplinary studies departments at a North American university who volunteered to participate, Garrison et al. also demonstrated, via structural equation modeling, that social presence mediated the relationship between teaching and cognitive presence in online courses, suggesting a dynamic relationship between all three elements of the CoI framework. The relationship between social presence and teaching presence was further supported by qualitative research conducted by Richardson et al. (2015). Analysis of case studies, constructed based on the Blackboard communication and interactions of 12 online instructors teaching master's level courses in learning design and technology at a United States university, revealed that social presence actions (e.g., the expression of humor or emotion) enhanced teaching presence actions such as providing examples or communicating expectations (Richardson et al., 2015).

Teaching presence. Given that perceptions of teaching, social, and cognitive presence predict student grades in online learning (Rockinson-Szapkiw et al., 2016), and each type of presence relates to the others (e.g., Garrison et al., 2010), course design that undervalues or ignores any of the presences may contribute to the problem of practice. But, course design elements or instructor actions that minimize teaching presence (e.g., unclear communication of expectations) may be particularly harmful to students in online courses. For example, Rockinson-

Szapkiw, Wendt, Wighting, and Nisbet (2016) investigated the relationship between the elements of the CoI framework and grades, by surveying 131 education graduate students taking one of two courses in educational technology at a private university in Virginia. Hierarchical multiple regression demonstrated that students' perceptions of teaching, social, and cognitive presence were all predictive of grades, and that among these teaching presence was the strongest predictor of grades. Teaching presence also influences both social presence and cognitive presence (Garrison et al., 2010), and may influence the quality of student learning over time in online courses (Garrison & Cleveland-Innes, 2005).

In addition to being important, teaching presence can be difficult to establish in online courses. Both Bolldén (2012) and Baran, Correia, and Thompson (2013) found that instructors struggled to establish teaching presence in online courses due to the time required to do so. Specifically, Bolldén conducted semi-structured interviews with three online professors at a Swedish university, two of whom were graduate-level education professors. Document analyses of course materials and observations of asynchronous and synchronous coursework from the professors' courses were also conducted. The participants expressed a variety of frustrations associated with establishing presence online, including with the time spent on establishing presence and with feelings of invisibility in between instances of using writing to communicate presence (e.g., by posting comments; Bolldén, 2012). Based on interviews with six experienced online instructors at a large Midwestern university in the United States, Baran, Correia, and Thompson concluded that instructors spent extra time trying to establish their presence in online courses by providing individual feedback, holding online office hours, and engaging with students on blogs and wikis.

In addition to the challenges associated with the time required to establish teaching presence online, online instructors can experience challenges related to feelings of unreadiness to teach online. Analysis of survey data regarding the experiences of 27 education faculty members who taught online at an Australian university suggested that most participants felt they lacked the necessary technological (i.e., 67%) and pedagogical (i.e., 81%) skills to teach online (Downing & Dyment, 2013). Low instructor confidence in both technological and pedagogical skills required for the facilitation of online learning as suggested by Downing and Dyment (2013) could also plausibly inhibit instructors' abilities to establish teaching presence. In summary, teaching presence is both important (Garrison et al., 2010; Garrison & Cleveland-Innes, 2005; Rockinson-Szapkiw et al., 2016) and potentially difficult to establish (Baran, Correa & Thompson, 2013; Bolldén, 2012; Downing & Dyment, 2013) in online courses.

Learner-Course Factor: Interactions in Online Learning Environments

As compared to course design features, which tend to exist at the exosystem level, interactions in the online learning environment exist at the microsystem level because they involve interactions between the focal individual (i.e., an online student with a low GPA) and others in the immediate environment (Neal & Neal, 2013). In a distance learning environment such as an online course, interactions can be further categorized as learner-instructor, learner-learner, or learner-content interactions (Moore, 1989). According to Moore (1989), learner-instructor and learner-learner interactions represent interactions with people who influence learning in a distance education course. Learner-content interactions, on the other hand, provide an example of interactions with objects and symbols. For example, online learners need to use an object (e.g., a computer) to interact with symbols (e.g., online text) necessary for learning content in an online course. Given that technology mediates all three of Moore's interaction

types in an online learning environment, a fourth type of interaction, learner-interface interaction, also relates to online learning (Swan, 2003). For example, if online students perceive a discussion forum as difficult to use, they may experience limited interactions with instructors, other learners, and the content. Frustration or confusion with interface interactions can lead to both lack of engagement in a course and reduced mental capacity for other interactions (Swan, 2003). Taken together, a learner's interactions with the instructor, other learners, content, and technological interfaces provide a comprehensive framework for considering interactional factors that influence students with low GPAs in online courses.

Learner-instructor interactions. Learner-instructor interactions include communication and flow of information between distance education students and instructors (Moore, 1989). According to Moore (1989), interactions may be text-based or verbal and synchronous or asynchronous. Evidence for the importance of online learner-instructor interactions includes their predictive relationship to student satisfaction (Kuo & Belland, 2016) and to sense of community (i.e., feelings of belonging to and being valued and supported by a group; Shackelford & Maxwell, 2012a).

In addition to relating to student satisfaction and sense of community, learner-instructor interactions relate to student academic success in online courses (Eom & Ashill, 2016; Jaggars & Xu, 2016). Analysis of 372 responses to a survey measuring multiple variables predicted to relate to online learning satisfaction and success (e.g., intrinsic and extrinsic motivation, learners' perceptions of course design) and administered to students taking online courses at a Midwestern U.S. university suggested that positive perceptions of learner-instructor dialogue most strongly predicted perceived learning (Eom & Ashill, 2016). A mixed-methods study conducted by Jaggars and Xu (2016) had similar findings. In their study, Jaggars and Xu evaluated 23 online

community college courses using a rubric that assessed course organization, presence of learning goals and assessments, appropriate use of technology, and interpersonal interaction. Using multilevel modeling with the course grades of 678 students, the researchers concluded that out of all course characteristics evaluated, only interpersonal interaction related to student grades. Further qualitative investigation of interpersonal interaction indicated that students valued interactions with instructors more than interactions with other students (Jaggars & Xu, 2016). Furthermore, in a 2012 study, also conducted in a community college setting, Kaupp (2012) found that online students perceived poor interactions with instructors, in particular, as a barrier to learning.

The relationship between learner-instructor interactions and online learners' success is clarified by insights into the experience and perceptions of online students and instructors provided by qualitative research. For example, in a qualitative study of three students who failed an online education course, Thompson, Miller, and Franz (2013) analyzed data from semi-structured interviews and archival data related to participants' engagement and grades in the online course. They found that participants did not reach out to instructors for help or accommodations when unexpected life events interfered with their coursework, which likely contributed to their failure (Thompson, Miller, & Franz, 2013). On the instructor side of the interaction, in Kaupp's (2012) study, interviews revealed that poor online learner-instructor interactions related in part to instructors' negative assumptions about learners' motivations and skills. Additionally, semistructured interviews of seven online teacher educators at Northern Kentucky University and Oranim Academic College of Education in Israel indicated that even experienced online instructors felt student-instructor interactions were limited due to the loss of visual and audible cues in the online environment (Huss, Sela, & Eastep, 2015). Given such

findings, warnings of weak learner-instructor interactions in online environments can come both from missing interactions and from negative interactions. Therefore, based on the work of Eom and Ashill (2016); Huss, Sela, and Eastep (2015); Kaupp; Kuo and Belland (2016); Jaggars and Xu (2016); Shackelford and Maxwell (2012a); and Thompson, Miller, and Franz; learner-instructor interactions constitute an important factor at the microsystem level for online learners.

Learner-learner interactions. Learner-learner interactions are similar to learner-instructor interactions in that they involve the communication and flow of information between people at the microsystem level, with learner-learner interactions being those between a student and his or her peers (Moore, 1989). Like learner-instructor interactions, learner-learner interactions predict sense of community in online courses (Shackelford & Maxwell, 2012b). Studies regarding the importance of learner-learner interactions beyond their influence on sense of community are limited, but this may be due to the challenges associated with establishing productive and authentic online learner-learner interactions (Jaggars & Xu, 2016).

Online learners may view interactions with other learners as tasks necessary to complete for a grade rather than as avenues for learning (Jaggars & Xu, 2016), and in particular may view asynchronous text-based interactions with other learners in this way (Hartnett, 2015). Video-based (Clark et al., 2015) and synchronous (Hartnett, 2015) discussions may improve online students' perceptions of learner-learner interactions, but synchronous interactions in particular may decrease the flexibility of online environments desired by online students (Falloon, 2012). Whereas it has yet to be determined if learner-learner interactions are less important than other interactions in online courses or whether online courses have yet to realize the full potential of learner-learner interactions, learner-content interactions may provide more insight into the problem of practice.

Learner-content interactions. Learner-content interactions have been positioned as foundational to education given that learner-instructor and learner-learner interactions cannot produce learning in the absence of learner-content interactions (Moore, 1989). Of Moore's (1989) three interaction types, Kuo and Belland (2016) found that learner-content interactions, as measured by a survey, were the strongest predictor of satisfaction for 167 students enrolled in online courses at a Southeastern university in the United States. Student satisfaction, in turn, positively correlated to student success in the courses ($R = .223$, $p < .01$; Kuo & Belland, 2016).

Related to learner-interactions is the construct of cognitive presence from the community of inquiry (CoI) framework. Cognitive presence refers to a learner's construction of meaning as a result of "sustained communication" (Garrison et al., 2000, p. 89). Communication is required to establish cognitive presence (Garrison et al., 2000), so learner interactions with instructors and other learners help to establish cognitive presence. However, because of the centrality of making meaning to the construct of cognitive presence (Garrison et al., 2000), learner-content interactions are fundamental to cognitive presence. That is, learner-learner and learner-instructor interactions would not establish cognitive presence without simultaneous interaction with content. Cognitive presence is operationalized through survey items such as "reflection on course content and discussions helped me understand fundamental concepts in this class" (Arbaugh et al., 2008, p. 135), which demonstrate the necessity of learner-content interactions for cognitive presence. Therefore, because cognitive presence has been shown to predict grades in online courses (Rockinson-Szapkiw et al., 2016), and learner-content interactions are necessary for cognitive presence, learner-content interactions are also necessary for students' success in online coursework.

Despite the importance of learner-content interactions in the online environment, online students can struggle to establish and sustain deep interactions with content. For example, based on the video diaries of 20 students in their first term of online learning, Brown, Hughes, Keppell, Hard, and Smith (2015) found that 75% of participants took a passive approach to learning, which was characterized by lack of strong study habits, lack of initiative for learning, and procrastination. Although Brown et al.'s study took place in New Zealand, the findings were supported by a similar study conducted from the instructor perspective in the United States (Wake & Bunn, 2015). Using autoethnography to study their own experiences as online instructors at the University of Central Arkansas, Wake and Bunn (2015) noted that education students struggled to interact with content in online courses. Specifically, students exhibited limited engagement with reading and writing assignments, and experienced challenges associated with tasks that required critical thinking, analysis, or creativity (Wake & Bunn, 2015). Based on findings supporting the importance of learner-content interactions in the online environment (e.g., Kuo & Belland, 2016) in conjunction with findings suggesting learners can struggle to interact with content in online courses (e.g., Wake & Bunn, 2015), learner-content interactions may contribute to the learning and experiences of students with low GPAs in online courses.

Learner-interface interactions. Learner-interface interactions relate to all aspects of online learning because they mediate all other interactions in online courses (Swan, 2003). For example, learner-learner interaction via discussion forum and email can lead to perceptions of miscommunication among online students, as compared to learner-learner interactions via audiovisual technologies (Huang et al., 2016). Additionally, because learner-interface interactions involve specific interactions with technology, the literature relevant to technological

choices in course design at the exosystem level can also be considered at the microsystem level in terms of how learners interact with technology. For example, complex technology may be used in courses due to course design choices, but can frustrate learners via their interactions with such technology (Falloon, 2012). Learners' interactions with technology that they perceive to be difficult to use may also relate to negative experiences in online courses (Teo & Wong, 2013).

All interaction types (i.e., learner-instructor, learner-content, learner-learner, and learner-interface interactions) may be relevant to students with low GPAs in online courses, although evidence related to the importance of learner-learner interactions in online courses is mixed (e.g., Jaggars & Xu, 2016; Shackelford & Maxwell, 2012b). Because learners' interactions with instructors, other learners, and content occur via technology in online courses (Swan, 2003) and therefore may be influenced by learner-interface interactions, learner-interface interactions may be particularly important interactions at the microsystem level. Learner-instructor interactions may also be particularly important at the microsystem level given their relationship to satisfaction (Kuo & Belland, 2016), sense of community (Shackelford & Maxwell, 2012a), and academic outcomes (Jaggars & Xu, 2016) in online courses. Just as interactions operate at the microsystem level, so do learner characteristics, which are considered next.

Learner Factor: Learner Characteristics

Reciprocal, meaning bidirectional, relationships between individuals, their behaviors, and their environments (Bandura, 1986) illustrate the importance of learner characteristics at the microsystem level. For example, when considering an online learner as the focal individual, if older learners are less comfortable with technology than younger learners, they might engage less in an online environment, and as a result receive less feedback from instructors in online courses. However, although multiple researchers have hypothesized that older students might

experience negative outcomes in or have negative perceptions of online coursework (e.g., Cochran et al., 2014; Fleming et al., 2017), older students, in fact, tend to have comparable or better outcomes in and perceptions of online learning as compared to younger students (Castillo-Merino & Serradell-López, 2014; Cochran et al., 2014; Fleming et al., 2017; Huang et al., 2016; Xu & Jaggars, 2014). Age also does not seem to relate to web-use skills, as measured by a survey assessing familiarity with current Internet-related terms such as phishing or RSS (Owens & Lilly, 2017). Therefore, age is not explored as a potential factor contributing to the experience or outcomes of students with low GPAs in online courses. But, other microsystem-level learner characteristics for which empirical support exists to suggest a connection to the problem of practice are considered in the following sections.

Self-regulation. Self-regulation is exemplified by an individual's ability and propensity to take actions that positively control and direct learning, such as goal setting or self-evaluation of progress (Zimmerman, 2008). Of the learner characteristics considered in this section, self-regulation may be the least relevant to students' performance in online courses given the mixed evidence regarding its importance in online learning (Broadbent & Poon, 2015). However, because some studies suggest self-regulation relates to outcomes in online courses (Broadbent, 2017; Lee, Choi, & Kim, 2013), self-regulation should still be considered as a factor potentially related to the experience and success of learners with low GPAs in online courses. Specifically, in a study of 169 education students enrolled in an online course at a Korean university, Lee, Choi, and Kim (2013) used multivariate analysis of variance to analyze students' survey responses related to their own metacognitive regulation skills. Analysis showed that students who dropped out had lower self-reported metacognitive self-regulation skills than those who completed the course (Lee, Choi, & Kim, 2013). Additionally, in a study of 491 students enrolled

in online courses at an Australian university, Broadbent (2017) collected survey data on the use of self-regulated learning strategies among the participants, along with participant course grades taken from university records. Descriptive statistics and analysis of covariance showed that students' use of elaboration and time management strategies positively correlated to course grades. However, students' use of rehearsal, another self-regulatory strategy, negatively correlated to grades (Broadbent, 2017). Furthermore, Kuo, Walker, Schroder, and Belland (2014) surveyed 180 online students at a college of education in the United States and found that self-regulation was not predictive of course satisfaction. Similarly, based on survey analysis, Eom and Ashill (2016) found that self-regulation neither related to satisfaction nor to perceived learning for 372 enrolled in online courses at a Midwestern university. Although students' self-regulation may relate to the success of students with low GPAs in online coursework, due to the conflicting nature of findings related to self-regulation in online learning (Broadbent & Poon, 2015), other learner characteristics, including gender, a demographic characteristic, may be more relevant.

Demographic characteristics. Research establishing the problem of practice also indicates that additional learner characteristics (i.e., characteristics beyond GPA) relate to negative outcomes in online courses. Specifically, both Figlio, Rush and Yin (2013) and Xu and Jaggars (2014) found that students of color–Hispanic students in the research of Figlio et al. and Black students in the research of Xu and Jaggars–tended to perform worse in online courses than in face-to-face courses. Analysis of grades from the records of California community college students demonstrated a similar trend among Latino students (Kaupp, 2012). All three of these studies that suggest students of color may perform more poorly in online courses than in face-to-face courses have quantitative research design strengths; Xu and Jaggars worked with a large

sample of 498,613 course enrollment records, Kaupp's (2012) work involved an even larger sample of 4.5 million student records, and Figlio et al.'s study used a randomized control trial experimental design. However, results of these studies conflict to some extent. For example, whereas Figlio et al. noted a trend in decreased online performance for Hispanic but not Black students, Xu and Jaggars noted the opposite: a trend in decreased online performance for Black but not Hispanic students. Such trends may be due to instructors' poor relationships with and unwarranted negative assumptions about students of certain races or ethnicities, as suggested by the qualitative component of Kaupp's study.

The patterns of success in online courses associated with gender are clearer than the patterns associated with race and ethnicity. The research conducted by both Figlio et al. (2013) and Xu and Jaggars (2014) suggested that male students tended to earn lower grades in online courses than in face-to-face courses. A study conducted by Cochran, Campbell, Baker, and Leeds (2014), found that male students were more likely to drop online courses than female students. And, as compared to male students in online courses, female students may have stronger interactions with instructors (Kuo & Belland, 2016) and perceive sense of community and learning more positively (Rovai, 2002). Unlike Rovai (2002), Shackelford and Maxwell (2012a) found that gender did not significantly relate to sense of community. However, given the number of studies suggesting that male students may experience negative consequences in online courses (Figlio et al., 2013; Kuo & Belland, 2016; Rovai, 2002; Xu & Jaggars, 2014), male students may be particularly at risk for negative outcomes and experiences in the online learning environment. The same may be true for students who have work, family, or financial obligations.

Employment, family, and financial status. Students who are parents, married, or employed tend to be more likely to take online courses (Ortagus, 2017). Qualitative research by

Brown et al. (2015) and Phirangee and Malec (2017) provides insight into the unique experiences of and challenges faced by students with family or employment obligations. Specifically, based on the video diaries they collected from students in their first term of online learning in New Zealand, Brown et al. found that both family and employment obligations contributed to the challenges experienced by students in online courses. Similarly, thematic analysis of semi-structured interview responses from six graduate students taking online courses at two Canadian universities suggested that employed students experienced "professional other[ing]" (Phirangee & Malec, 2017, p. 160) in online courses. Specifically, employed students perceived differences between their own and their peers' approaches to and needs within online coursework as a result of their employment (Phirangee & Malec, 2017). Furthermore, Choi, Lee, Jung, and Latchem (2013) surveyed 1,353 students who chose not to reenroll in online courses at Korea National Open University about their reasons for choosing not to reenroll. Among participants, high employment-related workload was the most frequently cited reason for choosing not to take additional online coursework (Choi et al., 2013).

Like work and family obligations, financial obligations or stress may contribute to the challenges faced by students in online courses. In terms of completion of online coursework, Cochran et al. (2014) found that students receiving loans were more likely to drop out of online coursework than others. Similarly, Rockinson-Szapkiw, Spaulding, and Spaulding (2016) found that financial variables contributed to an overall model of student persistence, suggesting that financial need and stress might be a barrier to persistence in online coursework.

Instructor perceptions of online students' ability to balance coursework with different obligations (e.g., family, employment) may not match students' perceptions of their own abilities (Parkes, Stein, & Reading, 2015). In a survey administered to 25 students and 10 instructors with

previous online learning experience at an Australian university, Parkes, Stein, and Reading (2015) asked participants to rate their own competency (i.e., in the case of the students) or their students' competency (i.e., in the case of the instructors) with skills related to e-learning. Students and faculty diverged in their ratings related to preparedness for balancing online coursework with other demands on their time. Rank order differentials revealed that students' ranked their ability to balance online coursework with competing obligations 38 places lower out of a total of 58 ranked competencies, than instructors ranked students' abilities in the same area (Parkes et al., 2015). Therefore, students with family, employment, or financial obligations may not get the support they need from instructors. Like student employment, financial, or family status, prior online learning experience is another contextual characteristic that may contribute to success in online courses.

Online learning experience. Prior online experience may be particularly relevant to the success of students with low GPAs in online courses. In a study on 962 community college students taking online courses, Hachey, Wladis, and Conway (2014) found that GPA prior to online course enrollment related to success (i.e., grades and retention) in online courses for students with no prior online learning experience but did not significantly relate to success among students with prior online experience. Instead, for students with online learning experience, performance in previous online coursework related to success in online courses considered in the study (Hachey, Wladis, & Conway, 2014).

In addition to Hachey et al.'s (2014) work, several studies suggest that prior online learning experience relates to the outcomes and experiences of online students. Previous online experience has been associated with self-efficacy in online courses (Bradley, Browne, & Kelley, 2017; Jan, 2015; Shen, Cho, Tsai, & Marra 2013; Zimmerman & Kulikowich, 2016), which is

discussed in more depth below, with the consideration of self-efficacy as a factor contributing to the success of students with low GPAs in online courses. Students with prior online experience may also use learning strategies more effectively (Wang, Shannon, & Ross, 2013) and experience a stronger sense of community (Shackelford & Maxwell, 2012b) in online courses than students without such experience. Students who have previously dropped an online course may be more likely to drop future online courses (Cochran et al., 2014). Based on the importance of prior online learning experience (e.g., Cochran et al., 2014; Hachey et al., 2014), lack of successful previous online learning experience may contribute to the problem of practice. Self-efficacy, the last learner characteristic considered here, may relate to both prior online learning experience and student outcomes and experiences in online courses.

Self-efficacy. Self-efficacy refers to a personal sense of ability regarding the achievement of specific actions required for success in a given setting and is a component of context- and task-specific motivation (Bandura, 1977). Because self-efficacy is tied to specific settings and tasks, it can be seen as related to online learners' motivations and behaviors at a microsystems level. For example, online learning self-efficacy might influence a student's likelihood to reach out to an instructor for guidance or support via email or during virtual office hours. Given the connection between self-efficacy and motivation (Bandura, 1977), self-efficacy likely relates to both the satisfaction and success of learners in online environments.

Self-efficacy tends to be higher among online students with prior online learning experience (Bradley et al., 2017; Jan, 2015; Shen et al., 2013; Zimmerman & Kulikowich, 2016). For example, Bradley, Browne, and Kelley (2017) surveyed 266 undergraduates at a university in the Southern United States and found that students who had taken two or more online courses had higher senses of self-efficacy related to online coursework than those who had taken one or

no online courses. Similarly, Shen, Cho, Tsai, and Marra (2013), using survey data from 406 online students enrolled at two Midwestern universities, demonstrated that previous online experience was associated with higher self-efficacy regarding completion of online courses and academic interactions with peers in online courses. Survey data from students (n = 338) enrolled in online courses at 18 campuses of a mid-Atlantic university in the United States also demonstrated that students with previous online learning experience had higher self-efficacy pertaining to online learning than students without previous experience (Zimmerman & Kulikowich, 2016). The relationship between self-efficacy and prior experience supports Bandura's (1977) theory of self-efficacy because "mastery experiences" (p. 197), meaning experiences in which an individual successfully completes a task or achieves a goal, theoretically contribute to self-efficacy.

Self-efficacy and satisfaction. Self-efficacy relates to student satisfaction in some online courses. For example, based on a survey of 897 students in an introductory technology course at a Korean University that measured self-efficacy using Pintrich and De Groot's (1990) self-efficacy scale, Joo, Lim, and Kim (2013) used structural equation modeling to show that self-efficacy affected satisfaction with the online learning experience, which in turn affected persistence (i.e., intent to enroll in another online course). Another survey-based study, using an online learning self-efficacy instrument constructed by the authors (Shen et al., 2013) with 406 volunteer participants taking online courses at two Midwestern U.S. universities, indicated that all identified dimensions of online learning self-efficacy predicted satisfaction in online courses. However, not all of the literature demonstrates a relationship between self-efficacy and satisfaction in online learning.

In a study of 103 survey respondents enrolled in online graduate courses at a U.S. university, Jan (2015) found no significant relationship between computer self-efficacy, as measured by the Computer Self-Efficacy Scale (Compeau & Higgins, 1995), and satisfaction. The same study also showed a significant but weak relationship between academic self-efficacy, as measured by the Academic Self-Efficacy Scale (Chemers, Hu, & Garcia, 2001), and satisfaction ($R = .23$, $p \leq .05$; Jan, 2015). Similarly, Kuo et al.'s (2014) research suggested that self-efficacy was not predictive of satisfaction among online undergraduate and graduate education students at a U.S. university who were surveyed using Eastin and LaRose's (2000) Internet self-efficacy scale.

Although Jan's (2015) and Kuo et al.'s (2014) research suggest that self-efficacy may have a more limited relationship to satisfaction with online learning than suggested by Joo et al.'s (2013) or Shen, Cho, Tsai, and Marra's (2013) work, both Jan's and Kuo et al.'s findings were limited by low participant response rates of 16% and 22% respectively. Jan's sample also included only one participant out of 103 with no prior experience with online coursework. This is important because previous online learning experience tends to relate to higher self-efficacy among online students (Bradley et al., 2017; Shen et al., 2013; Zimmerman & Kulikowich, 2016), and a sample with primarily experienced online students might diminish relationships that would be present if the sample included more participants with no prior online learning experience.

Given the low response rates in the studies suggesting limited or no relationship between self-efficacy and satisfaction in online courses (Jan, 2015; Kuo et al., 2014), and the prior online learning experience of 99% of the participants in one such study (Jan, 2015), self-efficacy may still relate to satisfaction in online courses, as suggested by Joo et al. (2013) and Shen et al.

(2013). Therefore, because students with low GPAs may theoretically have lower self-efficacy as previously discussed in terms of Bandura's (1977) theory, students with low GPAs may be less satisfied with online coursework than other students.

Self-efficacy and academic outcomes. In addition to relating to satisfaction, self-efficacy relates to academic outcomes in online courses. Two studies using structural equation modeling (Joo et al., 2013; Wang et al., 2013) have suggested that self-efficacy directly affects grades in online courses. The results of Joo et al.'s (2013) work, which were obtained based on research conducted at a Korean university as described above, were corroborated by a similar study in a different setting. Specifically, based on survey data from 256 undergraduate and graduate student volunteers taking online courses at a U.S. university, Wang, Shannon, and Ross (2013) concluded that technology self-efficacy directly influenced grades. Although Wang et al. used Miltiadou and Yu's (2000) scale to measure technology self-efficacy, and Joo et al. used Pintrich and De Groot's (1990) non-technology-specific self-efficacy scale, the complementary results found in different contexts support the importance of self-efficacy in online learning environments.

The relationship between self-efficacy and engagement may explain the link between self-efficacy and grades found by Joo et al. (2013) and Wang et al. (2013). Using Shen et al.'s (2013) scale to measure self-efficacy, Prior, Mazanov, Meacheam, Heaslip, and Hanson (2016) found that self-efficacy had a significant positive effect on 151 online students' engagement in interactions with peers, instructors, and the learning management system (i.e., the computer-based program that housed course materials and asynchronous interactions) used in their courses. Whereas Prior et al.'s research included participants who were all graduate students at an Australian business school and had a survey response rate of 41.9%, Pellas (2014) found a

similar link between self-efficacy and engagement in online courses with participants from six different countries and with a survey response rate of 87%. Undergraduate and graduate instructors who used Second Life, an online virtual world, for instruction were recruited by Pellas to send a survey to their students. The survey included the Internet Self-efficacy Scale (Torkzadeh & Van Dyke, 2001) and the Student Engagement in the Mathematics Classroom Scale (Kong, Wong, & Lam, 2003), which was edited to apply to a variety of subjects (Pellas, 2014). Hierarchical regression analysis of survey responses suggested that Internet self-efficacy positively related to cognitive and emotional engagement in online learning (Pellas, 2014). Because self-efficacy relates to satisfaction (Joo et al., 2013; Shen et al., 2013) as well as academic outcomes (Joo et al., 2013; Wang et al., 2013) and engagement (Pellas, 2014; Prior, Mazanov, Meacheam, Heaslip, & Hanson, 2016), self-efficacy is particularly relevant to online learning at the microsystem level when considering an online student as the focal individual.

Summary

Students with low GPAs in online courses tend to perform worse than they do in face-to-face courses (Figlio et al., 2013, Xu & Jaggars, 2014), and are also more likely to drop out of online courses than students with higher GPAs (Cochran et al., 2014). An analysis of the literature through an ecological systems perspective reveals the following categories of factors that may contribute to the problem of practice: online learning technology, course design and structure, interactions in the online environment, and learner characteristics. Based on their relevance to the success of online learners in higher education according to the research literature and potential for actionable intervention, six factors, shown in Figure 3 were prioritized for further study in this needs assessment. All six prioritized factors exist at least partially at the microsystem level (Neal & Neal, 2013), because the components of and interactions associated

with an online learner's immediate environment are best suited to an intervention in the context of the problem of practice. The six factors were teaching presence, learner-instructor interactions, learner-interface interactions, students' self-efficacy, students' gender, and students' prior experience with online coursework.

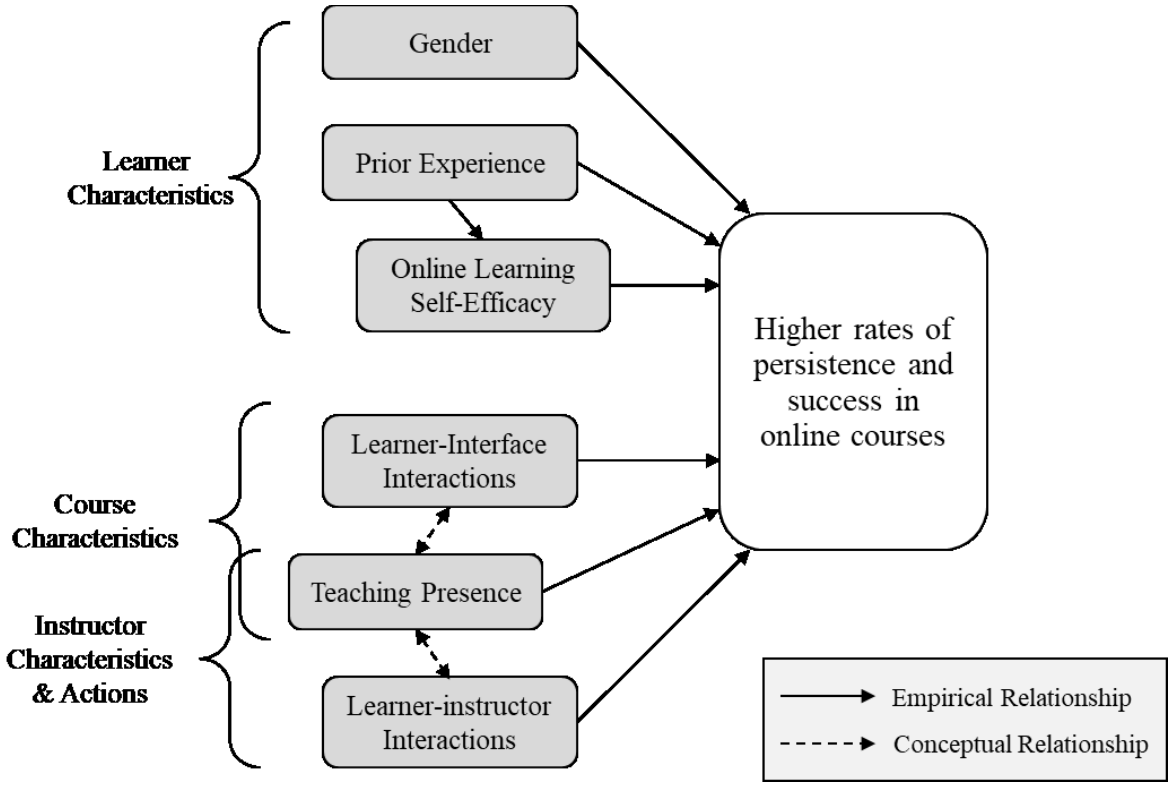

Figure 3. Conceptual framework for factors prioritized for study in the needs assessment. Each factor was prioritized for study based on its potential to impact student persistence and/or success in online courses, especially for students with low GPAs.

As shown in Figure 3, the factors prioritized for study in the needs assessment can be categorized in a conceptual framework as those related to learner characteristics, course characteristics, or instructor characteristics and actions. Because teaching presence is established based on course design and maintained by instructor actions (Arbaugh et al., 2008; Garrison et al., 2000), teaching presence conceptually relates to both course characteristics and instructor

characteristics and actions. Prior experience may promote self-efficacy (Bradley et al., 2017; Jan, 2015; Shen et al., 2013; Zimmerman & Kulikowich, 2016), so an arrow between these two factors is shown. Finally, each factor was prioritized for study based on empirical research suggesting its potential to impact student persistence and/or success in online courses, explaining all the left to right arrows shown in the Figure 3.

Chapter 2

Enrollment in online courses in the United States is increasing (Seaman et al., 2018) and institutions of higher education must ensure that access to online higher education can be translated into success for different groups of students, including those with low GPAs. Because students with low GPAs may earn lower grades or dropout at higher rates in online as compared to face-to-face courses or when compared to students with higher GPAs (Cochran, Campbell, Baker, & Leeds, 2014; Figlio, Rush, & Yin, 2013; Xu & Jaggars, 2014), factors that may contribute to the experience and performance of students with low GPAs in online courses at a graduate school of education in the United States were investigated. Six factors emerged from the literature review as particularly important for the learning and experience of students taking online courses, and were therefore prioritized for study in the needs assessment. These factors were teaching presence, learner-instructor interactions, learner-interface interactions, students' self-efficacy, students' gender, and students' prior experience with online coursework.

The Problem of Practice in Context

In the fall of 2017 and spring of 2018, students enrolled in online courses at a graduate school of education with multiple campuses in the United States who had low undergraduate GPAs (i.e., < 3.00) earned lower grades, on average, in online courses than in face-to-face courses, although differences were slight. Fall term online course enrollment data also indicated that students with low GPAs in online courses might have struggled more than other online students. Table 1 shows students enrolled in online courses by term and undergraduate GPA. In the fall term of 2017 and the spring term of 2018, as compared to students with higher undergraduate GPAs, a larger proportion of students with GPAs less than 3.00 failed to complete online courses or exited the program immediately after the completion of their online courses.

Table 1

Undergraduate GPA and Online Enrollment

	Total students enrolled	Students who did not complete their course or exited the program after completion[a]	
Undergraduate GPA	*N*	*n*	% of subgroup
Fall 2017 term			
< 3.00	58	6	10.3%
≥ 3.00	220	14	6.4%
Spring 2018 term			
< 3.00	51	6	11.8%
≥ 3.00	209	16	7.7%

Note. Students with missing undergraduate GPAs not included in data.

[a]Students did not complete online courses either because they exited the program entirely or switched to a face-to-face section. Three of the students with GPAs below 3.00 who did not complete their fall 2017 online courses switched to a face-to-face section, and one of the 14 other students who did not complete their fall 2017 online course switched to a face-to-face section. The remainder of the students who did not complete online courses, including all of those in the spring term, exited the program entirely, either during or immediately after the course.

Two caveats apply to the data from the fall 2017 term. First, three students with missing undergraduate GPA data were excluded from the analysis, and two of those three exited the program in the fall term. GPA data were missing for the two students who exited because they failed to graduate on time from their undergraduate institutions. Therefore, they may have had low undergraduate GPAs. If these students were included in the analysis above and assumed to have low GPAs, 13.3% of students with low GPAs did not complete their online courses or exited the program immediately after the completion of an online course in the fall term. Second, given the low number of students who left online courses or exited the program in both terms, results should be interpreted with caution.

Needs Assessment Purpose and Research Questions

The purpose of the needs assessment was to determine how student characteristics and perceptions contributed to the struggles of students with low GPAs at a graduate school of education in the United States. Specifically, the needs assessment sought to determine the extent to which students' perceptions of teaching presence, learner-instructor and learner-interface interactions, and their own gender and self-efficacy may relate to the problem of practice. Investigating each factor in context was essential for determining which factors were most relevant at the graduate school of education and later prioritizing an intervention that could best improve outcomes for students with low GPAs in online courses. Therefore, the research questions for the needs assessment were:

1. How do students in online courses at a graduate school of education perceive the teaching presence of their online instructors?
2. How do students in online courses at a graduate school of education perceive their own online learning self-efficacy?
3. How do students in online courses at a graduate school of education experience interactions with their online instructors?
4. How do students in online courses at a graduate school of education experience interactions with technology in their online courses?
5. How do the answers to the above questions compare for students with undergraduate GPAs less than 3.0 and other students?
6. How do the answers to the above questions compare for male and female students?
7. Does prior online learning experience relate to online learning self-efficacy, perception of teaching presence in online courses, or grades in online courses?

Research question six presents a gender binary, which oversimplifies gender identity (Richards et al., 2016). In the case of this needs assessment, four of the 71 participants did not report a gender identity, and the remainder of participants identified as either male or female. Because question six focuses on group trends by gender identity, and because students who identify as male may struggle in online courses in particular (Cochran et al., 2014; Figlio et al., 2013; Kuo & Belland, 2016; Rovai, 2002; Xu & Jaggars, 2014), results were analyzed for students who identified as either male or female. However, exploration of online students' experience with participants from a broader range of gender identities is recommended for future research.

Methods

A multi-method design, involving the combination of questionnaire, observation, and interview data collection, was used to answer the research questions. Secondary data from graduate student records were also used to measure undergraduate GPA, demographic characteristics (i.e., gender, age, race, and ethnicity), and course grades and completion. All data collected pertained to students taking online courses at a graduate school of education in the spring of 2018, and so the unit of analysis for the needs assessment is the individual student. A multi-method design was appropriate for the needs assessment given that questions one, two, and seven lent themselves to measurement via survey and quantitative analysis; questions three and four lent themselves to measurement and analysis via qualitative methods; and questions five and six allowed for the comparison of results according to undergraduate GPA and gender.

Participants

The population of interest for the needs assessment study included first year graduate students enrolled in online courses at a graduate school of education with multiple campuses in the United States. Although the graduate program is two years long, second year graduate

students were not included in the population of interest because the 2017-2018 academic school year was the first year fully online courses were offered with regular synchronous classes, and such courses were not available to second year graduate students. First year graduate students took fully online courses when their regional campus required them to do so or allowed them to opt in. Of the 255 students enrolled in online courses at the graduate school toward the end of the spring 2018 term, which is when the needs assessment data were collected, 56.5% chose the online format. The remaining 43.5% were required to take a course in the online format. All were concurrently enrolled in at least one hybrid course with regular face-to-face as well as online components.

A mix of probability and non-probability sampling was used to select participants from among the population of interest to complete the questionnaire. First, students directly taught by the researcher were excluded from the sample based on the potential for power dynamics to bias data or cause students to feel pressured to participate. Next, the population of interest was stratified to invite 200 participants, per institutional review board permission, to complete the questionnaire. All students with undergraduate GPAs under 3.00 (n = 50) were invited to participate, and an additional 150 students with undergraduate GPAs of 3.00 and above were randomly selected for participation. This procedure ensured that students with GPAs below 3.00 were oversampled given their importance to the problem of practice. Random selection of students with undergraduate GPAs of 3.00 and above was achieved by assigning random numbers to each potential participant using Microsoft Excel's RAND function. Potential participants were then ordered according to the random number assigned, from lowest to highest, and the first 150 potential participants on the list were invited to participate.

The same 200 students invited to participate in the questionnaire were also invited to participate in interviews. Based on outreach by the practitioner researcher alone, five students, all of whom had undergraduate GPAs of 3.00 or higher, participated in interviews. Consequently, additional targeted outreach to potential participants with undergraduate GPAs lower than 3.00 was conducted based on professor recommendations. Professors were asked to recommend participants based on their likelihood to be open and honest in an interview setting, as recommended by Turner (2010). Following the targeted outreach, an additional three students, all of whom had undergraduate GPAs below 3.00, were interviewed. Therefore, interview sampling was both purposive (i.e., based on the recommendations of professors) and convenience-based (i.e. based on those who expressed willingness to participate).

Sampling of classes for observation was also convenience-based. All online instructors (N = 7) were asked about their willingness to have a synchronous class observed as part of the needs assessment, and all expressed such willingness. From there, five class sessions taught by five different professors were chosen for observation based on the practitioner researcher's availability.

Instrumentation

Questionnaire. A questionnaire was used to measure student perceptions of teaching presence and online learning self-efficacy. Twelve items adapted from the teaching presence subscale of the community of inquiry framework (CoI) survey (Arbaugh et al., 2008) and 21 items adapted from the online learning self-efficacy scale (Zimmerman & Kulikowich, 2016) were included on the questionnaire. The questionnaire also included items that measured the number of online courses completed by respondents prior to enrollment in online courses at the graduate school and respondents' grades in the most recent online course taken prior to

enrollment in online courses at the graduate school. A research methods faculty member reviewed these items.

Teaching presence refers to the actions taken by an instructor prior to and during an online course to guide and facilitate learning (Arbaugh et al., 2008; Garrison, Anderson, & Archer, 2000). The CoI survey includes three subscales corresponding to each type of presence in the framework (i.e., teaching, social, and cognitive). Sample items from the teaching presence subscale that were used in the needs assessment included "the instructor clearly communicated important course goals," and "the instructor provided feedback in a timely fashion" (Arbaugh et al., 2008, p. 135).

The expertise of the authors of the CoI framework survey served as a starting point for establishing content validity. The survey was developed in collaboration with multiple researchers with experience with the CoI framework, including Garrison, one of the framework's originators. The survey was further validated when all three subscales demonstrated a predictive relationship to grades, with teaching presence being the most predictive (Rockinson-Szapkiw et al., 2016). Initial testing of the survey, which involved 287 graduate students at four institutions, confirmed a three-factor interpretation of the survey and yielded a Cronbach's alpha of .94 for the teaching presence subscale. Therefore, Arbaugh et al. (2008) established teaching presence, as measured by the CoI framework survey, as a valid construct with internal consistency.

Self-efficacy refers to a personal sense of ability regarding the achievement of specific actions required for success in a given setting (Bandura, 1977). Online learning self-efficacy refers to an individual's sense of personal capabilities relative to tasks necessary for successful learning in online environments (Shen, et al., 2013; Zimmerman & Kulikowich, 2016). The online learning self-efficacy scale includes three factors (i.e., technology use, time management,

and online learning). Survey respondents rated statements describing specific tasks on the survey on a scale of one to six, with one corresponding to a perception "that they would perform the task poorly," and six corresponding to a perception "that they could perform the task at an expert level" (Zimmerman & Kulikowich, 2016, p. 184). Sample tasks on the scale included "navigate online course materials efficiently," "meet deadlines with very few reminders," and "learn without being in the same room as the instructor" (Zimmerman & Kulikowich, 2016, p. 184).

The process used by Zimmerman and Kulikowich (2016) to develop the online learning self-efficacy scale, including literature review, pilot testing, and interviews of experts, helped to establish the scale's content validity. The scale also showed divergent validity (i.e., results demonstrated little or no correlation to the theoretically unrelated constructs like age) and convergent validity (i.e., results correlated to the theoretically related constructs of previous online course completion, opinion of online learning, and likelihood of taking an online course; Zimmerman & Kulikowich, 2016). Through their initial testing with 338 undergraduate participants, Zimmerman and Kulikowich (2016) also established internal consistency by demonstrating Cronbach's alpha values ranging from .84 to .89 for the subscales on the online learning self-efficacy scale.

Because reliability and validity of survey data are difficult to establish (Porter, 2011), cognitive interviews – interviews in which respondents think aloud as they complete survey items (Desimone & Le Floch, 2004; Presser et al., 2004) – with two online students were conducted by the researcher. One of the students was a graduate student in the context of the problem of practice, and the other was an online doctoral student in the school of education at a different university. The cognitive interviews led to five item revisions involving increased specificity, and two item deletions based on limited meaning or applicability in the context of the

problem of practice. Original and revised items from both scales can be found in Tables A1 and A2 in Appendix A. Cognitive interviews also revealed issues with the four-point scale used with the CoI framework survey. On the survey's scale, four corresponded to strong agreement and one corresponded to strong disagreement (Arbaugh et al., 2008). The interviews suggested that more response options could better capture the range of participant perceptions. Increasing the number of response options on a scale can also increase the reliability and validity of survey data (Lozano, García-Cueto, & Muñiz, 2008; Preston & Colman, 2000). Therefore, the CoI framework survey was administered with a revised seven-point scale.

Because edits were made to items and response options in the questionnaire, after the questionnaire was administered, the internal consistency of each scale was re-checked. For the teaching presence scale used in the needs assessment, Cronbach's alpha was .93. Within the online learning self-efficacy scale, the technology subscale had a Cronbach's alpha of .84, the learning subscale had a Cronbach's alpha of .89, and the time management subscale had a Cronbach's alpha of .91. Therefore, reliability of the questionnaire's subscales remained high after the minor edits were made.

Observations. Observations were conducted in order to explore students' experiences with learner-instructor and learner-interface interactions in online courses at the graduate school of education. Student-instructor interactions include any instances of communication between a student and the instructor. Interactions may be text-based or verbal and synchronous or asynchronous (Huss, Sela, & Eastep, 2015; Kuo & Belland, 2016; Moore, 1989; Shackelford & Maxwell, 2012a). Student-interface interactions include any instances of a student attending to or engaging with the online environment in a way that mediates interactions with content, other learners, or the instructor (Swan, 2003). Observations of synchronous online classes were

conducted in a non-participant format, meaning that the researcher minimized interactions with participants (Lochmiller & Lester, 2017). Interviews, discussed next, explored the same constructs as the observations, thus allowing for triangulation of data, which contributes to the credibility of the findings (Guba, 1981).

Interviews. Interviews, like observations, were conducted to learn about participant experiences interacting with instructors and technological interfaces. Interviews were semi-structured to allow for comparison of participant responses regarding their interactions with instructors and technology. Individualized follow-up questions were asked in interviews when necessary for clarification or further exploration of something a participant shared. The needs assessment interview guide can be found in Appendix B and was tested with an online graduate student at another institution and reviewed by a research methods faculty member prior to finalization. As part of the multi-methods approach to the needs assessment, observations and interviews produced complementary qualitative data related to online students' experiences with instructor and interface interactions.

Researcher as instrument for qualitative data. The practitioner researcher who conducted the observations and interviews is the dean of online instruction at the institution, which may have influenced participants in both the observation and interview settings. To minimize this influence, safeguards were put in place. First, no students taught directly by the researcher were included in the study. Second, participation was optional and came with no rewards or repercussions. Participants were reminded that they could stop at any time. Last, no identifying information was collected during observations and participation in the interviews was confidential. Participants were reminded of both of these points before deciding whether to participate.

Data Collection

All data were collected during the spring term of 2018 or shortly thereafter. Observations were conducted prior to questionnaire administration and interviews. Figure 4 shows the timing of data collection for the needs assessment.

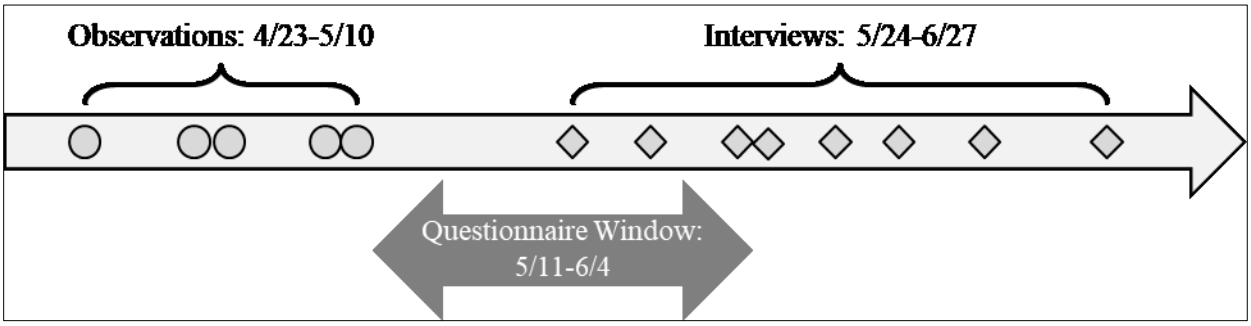

Figure 4. Observations, interviews, and questionnaire administration for the needs assessment. Individual observations are marked with circles and individual interviews are marked with diamonds. All dates are in 2018.

Questionnaire. The questionnaire was administered online based on the expediency and low cost associated with web-based surveys (Dillman, Tortora, & Bowker, 1999). The questionnaire was emailed to participants after the last synchronous class of the spring 2018 term, but before final assessments in each course were due. Participants had a 3.5-week window to complete the questionnaire and received two reminder emails before the close of the window. All emails requesting questionnaire participation were sent directly to individual participants by the researcher and contained information about the purpose of the research and the optional nature of the questionnaire. The following text appeared at the beginning of the questionnaire, as per institutional review board guidelines: “By completing this survey or questionnaire, you are consenting to be in this research study. Your participation is voluntary and you can stop at any time.” Online professors also provided information about the questionnaire in the last synchronous session of the term, emphasizing its optional nature and making clear no negative repercussions would be associated with choosing not to participate.

The practitioner researcher did not have access to any identifying data via the questionnaire. Rather, another employee of the graduate school associated questionnaire responses with student records, and then stripped the questionnaire data of identifying information (e.g., participant email addresses) before providing the combined data to the researcher. The practitioner researcher never had access to questionnaire data with identifying information, and such data were destroyed after responses were associated with data from student records (e.g., undergraduate GPA, demographic characteristics) and de-identified.

Observations. Online courses at the graduate school of education combine asynchronous and synchronous instruction, with synchronous classes occurring nine to ten times per term-long course during the spring term of 2018. Five non-participant observations were conducted in synchronous class sessions taught by different professors across approximately three weeks toward the end of the spring 2018 term. For each observation, the practitioner researcher emailed graduate students in advance to make them aware of the observation and its purpose; the optional nature of participation; the fact that identifying information (e.g., names) would not be collected; the non-evaluative nature of the observation for both instructors and students; and the process for giving consent, as well as withdrawing from participation later if desired, for students who chose to participate. No incentives were offered for participation, and it was also made clear that no negative repercussions would be associated with choosing not to participate. Each observation occurred during a two-hour synchronous class session held on Zoom, an online videoconferencing platform. At the beginning of each observation, the practitioner researcher reiterated the information contained in the email sent out in advance and emailed electronic consent forms to all students except those who indicated via private chat message that they did not wish to participate. Once students received the form, it was reiterated that providing consent

via signature was optional, and if they chose not to sign the consent form, their information would not be included in the data collection. Students then read and chose to sign or not sign the form. Before beginning observational data collection, the practitioner researcher identified the non-consenters, and did not collect any data pertaining to individuals who chose not to participate.

Field notes collected during each observation included a record of the observations as well as the practitioner researcher's reflections that were not direct observations (e.g., feelings or interpretations associated with the observations). This combination of "low-inference descriptors" (LeCompte & Goetz, 1982, p. 41) and notes about a researcher's thoughts during an observation can minimize biased interpretation of observational data because assumptions and feelings that may be a source of bias are made explicit, and thus can be accounted for in analysis. The observation notes focused on what was said and done by the instructor and students during the synchronous classes, and detailed notes pertaining to speech or actions that indicated a student was interacting with the instructor or with technology were prioritized. In addition to the in-the-moment notes, following each observation a post-observation memo was completed. Each memo included a record of initial interpretations related to the observation (Lochmiller & Lester, 2017) and any observations that seemed particularly salient, meaning those that were interpreted as "noteworthy," "interesting," or "telling" (Wolfinger, 2002, p. 89). The combination of field notes accounting for both observations and reflections and post-observation memos were included in the data collection procedure to enhance the dependability and confirmability of the research (Guba, 1981).

Semi-structured interviews. Semi-structured interviews were conducted via Zoom in May and June of 2018 with eight participants based on participant availability. At the beginning

of each interview, the practitioner researcher explained the purpose of the interview, noted that the interview was confidential and that the participant could ask clarifying questions or stop the interview at any time, and previewed the amount of time the interview was expected to take (i.e., 15-30 minutes), as recommended by Turner (2010). It was also explained that the audio would be recorded so that it could be transcribed for later analysis. Then, a consent form was emailed to the participant for electronic signature, noting that they could also choose not to sign and end the interview. Once the participant signed the consent form, the interview began.

Secondary data. Secondary data were collected from the graduate school's student information system. Secondary data pertaining to undergraduate GPA, course grades, course completion, and demographic characteristics were used as part of the needs assessment. Specifically, secondary data were combined with questionnaire data and then stripped of identifying information by an individual otherwise unassociated with the research. All data that included identifying information were then destroyed. As described in the preceding section on the questionnaire, this ensured that the practitioner researcher never had access to data with identifying information.

Data Analysis

Questionnaire data were quantitatively analyzed using descriptive statistics. Mann-Whitney U tests were also used for comparisons between student groups (i.e., between students with undergraduate GPAs below 3.00 and those with higher GPAs, and between male and female students) given that participant responses were not normally distributed. Observational and interview data were qualitatively analyzed.

Specifically, observational and interview data were collected to support answers to the following research questions:

3. How do students in online courses at a graduate school of education experience interactions with their online instructors?
4. How do students in online courses at a graduate school of education experience interactions with technology in their online courses?

Based on the research questions, analysis of both observational and interview data began with the establishment of deductive codes related to learner-instructor and learner-interface interactions. Idiosyncratic use of definitions and codes associated with constructs can threaten external reliability and validity in qualitative research (LeCompte & Goetz, 1992), whereas deductive coding grounds analysis in literature. Deductive codes related to learner-learner interactions were also added after a pre-coding read of observational field notes based on the number of learner-learner interactions taking place in synchronous classes. Deductive codes related to learner-instructor and learner-learner interactions were based on the work of Moore (1989), and Shackelford and Maxwell (2012a, 2012b). Interaction types in distance education were originally conceptualized by Moore. Shackelford and Maxwell, in their two studies, synthesized empirical research to develop descriptive categories for learner-instructor and learner-learner interaction types important in online learning environments. Deductive codes related to learner-interface interactions were based primarily on Swan's (2003) work, which synthesized both theoretical and empirical literature on learner-interface interactions, and therefore provided a comprehensive explanation of the dimensions of the construct.

After preliminary coding of observational field notes and interview transcripts using deductive codes, inductive codes were added to the list and some deductive codes were revised. Another round of inductive addition and revision occurred after preliminary coding of interview transcripts. Allowing for inductive revision minimizes one drawback of deductive codes, which

is that they can constrain analysis and interpretations, especially if unexpected data arise (LeCompte & Goetz, 1982). Table 2 shows sample inductive and deductive codes related to learner-interface interactions, and a complete list of codes used in the final analysis can be found in Appendix C. Original and revised codes were saved to establish an audit trail, which enhances dependability in qualitative research (Krefting, 1991). After codes were revised, observational data were revisited for final coding associated with the preliminary analysis, and themes were identified based on the codes.

Table 2

Sample Observation and Interview Codes

Code	Definition	Source
	Learner-interface Interaction	
Page design	The structure of webpages used in online courses (e.g., the extent of scrolling required, or the layout of text on the page).	(Swan, 2003)
Technology transfer	Learner use of technology introduced via an online course in another setting (e.g., use of technology from their online course with their own students).	Inductive

Findings

Questionnaire, interview, and observational data were analyzed along with secondary data to answer the research questions. Administration of the questionnaire yielded a response rate of 35.5% (n = 71 responses). Among students who participated in the questionnaire, 22.5% (n = 16) had undergraduate GPAs below 3.00, compared to 20.0% (n = 50) in the target population (i.e., all students enrolled in online courses at the graduate school). Questionnaire participants had an average undergraduate GPA of 3.27, whereas students in the target population had an average undergraduate GPA of 3.30 Tables 3 and 4 compare the demographics of the

questionnaire respondents with the demographics of the target population. Demographic characteristics of questionnaire respondents and the target population were generally similar, with the largest difference being that there was a lower percentage of Hispanic or Latino students among the questionnaire participants as compared to the target population.

Table 3

Age for Target Population and Participants

	Target Population	Questionnaire Participants
Minimum Age	21	21
Maximum Age	57	49
Mean Age	27	29
Median Age	25	27
Mode Age	23	23

Table 4

Ethnicity, Gender, and Race for Target Population and Participants

	Target Population		Questionnaire Participants	
	N	% of population	*n*	% of population
Ethnicity				
Hispanic or Latino	45	18.0%	9	12.7%
Not Hispanic or Latino	204	81.6%	62	87.3%
Not reported	1	0.4%	0	0.0%
Total	250	100%	71	100%
Gender				
Female	165	66.0%	45	63.4%
Male	77	30.8%	22	31.0%
Not reported	8	3.2%	4	5.6%
Total	250	100%	71	100%

	Target Population		Questionnaire Participants	
	N	% of population	*n*	% of population
		Race		
American Indian or Alaska Native	1	0.4%	0	0.0%
Asian	15	6.0%	6	8.5%
Black or African American	75	30.0%	20	28.2%
White	94	37.6%	26	36.6%
Multiple racial identities	10	4.0%	4	5.6%
Not reported	55	22.0%	15	21.1%
Total	250	100%	71	100%

Research Question One

Questionnaire data were analyzed to answer the first research question:

1. How do students in online courses at a graduate school of education perceive the teaching presence of their online instructors?

Overall, participants responded positively to questionnaire items related to teaching presence, having an average response of 6.5 across all items on the seven-point scale. On the teaching presence survey's scale, a choice of seven corresponded to strong agreement and a choice of one corresponded to strong disagreement. Furthermore, there was little variation by individual item. As shown in Table 5, means for individual items ranged from a minimum of 6.4 to a maximum of 6.7. Individual participant mean scores ranged from 5.3 to 7.0.

Table 5

Mean Responses on Teaching Presence Scale Items

Item (Arbaugh et al., 2008)	Mean Response
The instructor clearly communicated important course topics	6.6
The instructor clearly communicated important course goals	6.6
The instructor provided clear instructions on how to participate in course learning activities	6.5
The instructor clearly communicated important due dates/time frames for learning activities	6.7
The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking	6.5
The instructor helped to keep course participants engaged and participating in productive dialogue	6.5
The instructor helped keep the course participants on task in a way that helped me to learn	6.5
The instructor encouraged course participants to explore new concepts in this course	6.5
Instructor actions reinforced the development of a sense of community among course participants	6.4
The instructor facilitated course discussions in a way that helped me to learn*	6.4
The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives	6.4
The instructor provided feedback in a timely fashion	6.5

Note. All items but the one marked with the asterisk (*) are directly from Arbaugh et al.'s (2008) scale. The item marked with the asterisk was edited slightly based on cognitive interviews. See Appendix A for more information.

Research Question Two

Questionnaire data were also analyzed to answer the second research question:

2. How do students in online courses at a graduate school of education perceive their own online learning self-efficacy?

Participant responses varied more on the online learning self-efficacy portion of the questionnaire as compared to the teaching presence portion. The online learning self-efficacy scale used a six-point response scale with one corresponding to a perception of poor task performance and six corresponding to a perception of expert task performance (Zimmerman & Kulikowich, 2016). The average response across all items on this portion of the questionnaire was 5.1, and average responses on individual items ranged from 4.2 to 5.7. The distribution of average responses had a slight negative skew with a skewness value of -0.39 and was not normal given the kurtosis value of -1.09, which indicated the distribution was flat compared to a normal distribution. Individual participant's average scores ranged from 2.3 to 6.0.

When the online learning-self-efficacy items were grouped by factor as defined in the original publication of the survey (Zimmerman & Kulikowich, 2016), participants, on average, responded most positively to those items related to the technology use factor (M = 5.3), followed by the learning factor (M = 5.0), followed by the time management factor (M = 4.8). Participants in Zimmerman and Kulikowich's study (2016) also responded most positively to the items related to the technology use factor, but rated the learning factor the lowest. Figure 5 shows the average for each item included in the online learning self-efficacy portion of the questionnaire in this study, according to factor. Notably, the average response for each item related to the time management factor, which included items such as "focus on schoolwork when faced with distractions" and "develop and follow a plan for completing all required work on time" (Zimmerman & Kulikowich, 2016, p. 184), was less than 5.0. However, the item with the single lowest average, "use the library's online resources efficiently" (Zimmerman & Kulikowich, 2016, p. 184) was related to the learning factor.

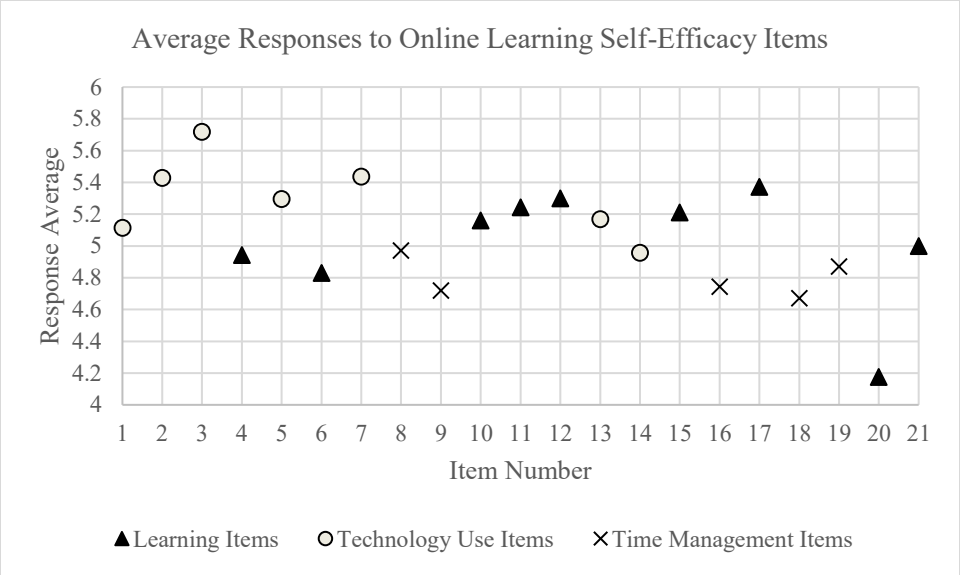

Figure 5. Average participant response to online learning self-efficacy items. Factors identified by Zimmerman and Kulikowich (2016) are shown in the legend.

Research Question Three

Interview transcripts and observational field notes were analyzed to answer research question three:

3. How do students in online courses at a graduate school of education experience interactions with their online instructors?

Different themes related to leaner-instructor interactions arose from the analysis of the observational notes and the analysis of the interview transcripts. The theme of facilitation, meaning instructor guidance of group learning, describes most learner-instructor interactions in the synchronous classes observed. Codes such as "discussion facilitation," "instructor framing," and "technology explanation" commonly applied to observational field notes, whereas codes such as "instructor content presentation" or "individual learner-instructor dialogue" rarely applied. Actions from observed synchronous classes that exemplified these codes included an instructor posing a question and calling on multiple students to respond (i.e., discussion

facilitation), an instructor previewing the purpose and agenda for the synchronous class (i.e., instructor framing), and an instructor explaining how students should use technology to complete a task in small groups (i.e., technology explanation). However, there were also exceptions to the theme of facilitation. For example, one instructor had students engage in individual planning in their own Google Documents during a synchronous class, and added comments to each student's work as they planned. This practice allowed for individual learner-instructor dialogue.

In contrast to the theme of facilitation that emerged from observational data, interview data suggested that students focused on one-on-one supports when discussing their experiences of interactions with instructors. In fact, "individual learner-instructor dialogue" was the only code applied across all eight interview transcripts. All but one student, who focused more on email when discussing individual interactions with their professor, specifically noted synchronous individual support on Zoom, either via office hours or via staying on Zoom after class was over, as beneficial. As one student described:

> For my final I set office hours and I brought her my PowerPoint and I shared my screen and I showed her going through: 'okay, if I do this, like what would my grade be? Or where would you score me?' And she gives like, 'Okay, well if you do this you're going to score this; if you're going to do that then this will actually bump you up because you're scaffolding a little bit less.' And I thought her feedback was very, very helpful because I know exactly what she was looking for and how to deliver it. I also like the extra help with her giving her ideas about how to present the lesson where it's more of a heavy lift on students.

When interviewed, students also mentioned interactions with instructors during synchronous classes, but less often. For example, two students noted that instructor presentation of content in

class was clear and useful, and three mentioned clear expectations presented by the instructor during class.

Student discussion of interactions with instructors was mostly positive, as shown in the examples above, and no student described only negative interactions. Exceptions to the overall positive attitude toward interactions were mostly minor. For example, one student described an interaction in which the instructor's email did not send, and so the instructor thought they had replied to the student but had not. The student followed up this example by describing the rest of their interactions with the instructor as "spot-on."

Research Question Four

As with research question three, interview transcripts and observational field notes were analyzed to answer research question four:

4. How do students in online courses at a graduate school of education experience interactions with technology in their online courses?

Attention to technology during observations involved short amounts of time focused on technology issues, explanation, or modeling. The "technology issue" code was applied throughout the field notes for two of the five observations and less often in the remaining three observations, but no technology issues constituted a major disruption of learning. For example, in one observation a graduate student said, "I'm sorry you cut out, can you say that again?" to another student, but did not have to ask a second time. In another observation, a student asked to read aloud could not do so because her webpage had not yet loaded; so the professor simply called on another student to read. Only one instance of a technology issue required an instructor to adjust their instructional method, and the adjustment only took about two minutes. In this instance, a web-based writing and posting tool was not allowing graduate students to post their

thoughts. After prompting students to refresh the page once, the instructor instead prompted students to share their thoughts verbally. A graduate student immediately unmuted to participate, thus beginning discussion.

Similarly, codes for technological explanation and technological modeling were common in four of the five observations and were not associated with major disruptions of learning. Some instances of technological explanation or modeling replaced similar directions that would have been given in a face-to-face class, for example when an instructor provided graduate students with directions about where to find a resource. But, other instances of technology explanation or modeling were unique to the online environment. For example, one instructor explained how to adjust the resolution on a video before students watched it in case any students had low Internet bandwidth, and another explained how and where time reminder pop-up messages would appear on the screen during small group work in breakout rooms.

Analysis of interview data revealed positive student interactions with technology as well as narratives about learning new technologies. Examples of positive interactions with technology included four students who used technologies they learned about in their online courses with their own students and four who went back to online instructional materials after they were first introduced to revisit content. Additionally, six of the eight students described their experience in online courses at the graduate school as at least somewhat new, and had generally positive perceptions of the newness. For example, one student said, “it was fascinating to go through all of these question marks that I had as a learner and discovering new ways of learning and interacting in that learning environment,” while another noted, “being able to interact and actually seeing the professor and seeing the whole class while we’re doing it was really, really different and fun.” Although one student described the learning curve as challenging, the same

student also stated, “with regards to…Nearpod and everything else, I thought that was great. I think that being able to connect with learning in a way that number one is different but it’s also the way the world is going [is useful].”

All students also described problems with technology, although some described issues that other students or the instructor had as frustrating, whereas others described their own frustrations with technology. For example, one student noted that other students struggled to adjust to the online learning environment, implying that they themselves did not struggle. In comparison, a different student described their own confusion in learning to navigate online assignments and manage multiple windows during synchronous classes. Those students who described their own problems with technology tended to describe technology interactions that were confusing or complex, although one student noted an issue with completing a video assessment because the memory card on her camera was full.

Research Question Five

Data related to the previous four research questions were further analyzed to answer the fifth research question:

5. How do the answers to the above questions compare for students with undergraduate GPAs less than 3.0 and other students?

Analysis of questionnaire data revealed that online learning self-efficacy might be more important in the context of the problem of practice than perceptions of teaching presence. For online learning self-efficacy, the average response across all items for students with undergraduate GPAs below 3.00 was 4.8 (SD = 0.8, n = 16), whereas the average response for those with higher undergraduate GPAs was 5.1 (SD = 0.6, n = 54). The Mann-Whitney U test for comparing mean ranks was used to compare the responses of participants with low

undergraduate GPAs (i.e., < 3.00) and participants with higher GPAs on the self-efficacy measure as a whole as well as on each subscale. A parametric test could not be used for comparisons because data distribution was not normal for at least one group in each comparison as indicated by skewness or kurtosis values outside of the normal range.

The results of the Mann-Whitney U test suggested that the difference in online learning self-efficacy between and students with lower and higher GPAs was not significant at the .05 level, $U = 310.5$, $p = .089$. However, when the two groups were compared according to responses related to the time management factor from the online learning self-efficacy scale (Zimmerman & Kulikowich, 2016) only, the group with undergraduate GPAs below 3.00 ($M = 4.3$, $SD = 1.1$, $n = 16$) had significantly lower responses than students with higher undergraduate GPAs ($M = 4.9$, $SD = 0.9$, $n = 54$), $U = 277.5$, $p = .03$. Differences between the two groups' responses related to the factors of learning and technology use on the online learning self-efficacy scale were not significant. Perceptions of teaching presence also did not differ significantly between students with low undergraduate GPAs ($M = 6.3$, $SD = 0.4$, $n = 16$) and other students ($M = 6.6$, $SD = 0.5$, $n = 54$), $U = 298.5$, $p = .06$.

Interview data were also compared according to undergraduate GPA. As described previously, all students described both positive and negative interactions with technology. However, in terms of negative interactions, all students with undergraduate GPAs below 3.00 described their own struggles with technology. In comparison, of the students interviewed with higher GPAs, three out of five described only the problems related to others (e.g., something they wished the instructor would do differently when using technology or issues they noticed other students having), and two of the five described their own struggles.

Students with low undergraduate GPAs tended to describe time management-related issues differently than other students. Specifically, two of the three students interviewed who had undergraduate GPAs below 3.00 described challenges in managing their own time, especially when it came balancing the responsibilities of their jobs with graduate school. For example, one described:

> A lot of it, I mean, I put on myself because I'm not really good at planning and, you know, managing my time. It's just really putting forth the effort to get those assignments done. I felt like in the first semester, well in the summer I really did a good job because I really didn't have anything else to do…By the spring, I kind of was like too overwhelmed with everything at school [referencing the school at which the student works, not graduate school]. With like state testing and I'm getting the kids ready for their trip or whatever.

Furthermore, the two students with low undergraduate GPAs who brought up their time management struggles did so even though no specific questions about time management were asked in the interviews. In contrast, although one student with an undergraduate GPA over 3.00 mentioned a desire for more reminders about assignment due dates in relation to interactions with technology, no students with undergraduate GPAs over 3.00 mentioned struggles managing their own time. However, because no questions about time management were asked, it cannot be said that the students with higher GPAs managed their time easily. Rather, in comparison to the two students described above, they did not proactively bring up time management struggles during their interviews. Some did mention time, but only in terms of the order of topics presented in the class or the scheduling of synchronous classes.

Research Question Six

Data collected for the first four research questions were also analyzed to answer the sixth research question:

6. How do the answers to the above questions compare for male and female students?

As with the analyses conducted to compare the survey responses of students with lower and higher GPAs, survey responses were compared according to gender using the Mann-Whitney U test. The Mann-Whitney U test was used because at least one group in each comparison had responses that were not distributed normally as indicated by skewness or kurtosis values outside of the normal range. Overall, female students reported higher online learning self-efficacy (M = 5.1, SD = 0.6, n = 45) than male students (M = 4.8, SD = 0.8, n = 22). However, the difference was not significant at the .05 level, U = 360, p = .071. But, analysis of the time management subscale alone showed a significant difference between male and female students, U = 316, p = .016, with female students reporting higher time management self-efficacy (M = 5.0, SD = 0.8) than male students (M = 4.3, SD = 1.1). Differences by gender on the two other subscales of the online learning self-efficacy scale (i.e., technology use and online learning; Zimmerman & Kulikowich, 2016) were not significant. Additionally, male and female students did not have significantly different perceptions of teaching presence, U = 468.5, p = .72. Although both male and female students mentioned time management challenges in interviews, given that male students' self-efficacy for time management in the online learning environment was significantly lower than that of female students, gender may be a relevant factor related to online students' success and experience at the graduate school of education.

Research Question Seven

Questionnaire data were analyzed to answer the last research question:

7. Does prior online learning experience relate to online learning self-efficacy, perception of teaching presence in online courses, or grades in online courses?

Based on questionnaire responses, neither the number of prior online courses completed nor the grade in most recent online course completed related to current online course grade, online learning self-efficacy, or perceptions of teaching presence. Figures 6-9 show the lack of clear trends related to prior online learning experience. Number of prior online courses in each figure refers to the number of online courses a participant took before graduate school (e.g., as an undergraduate).

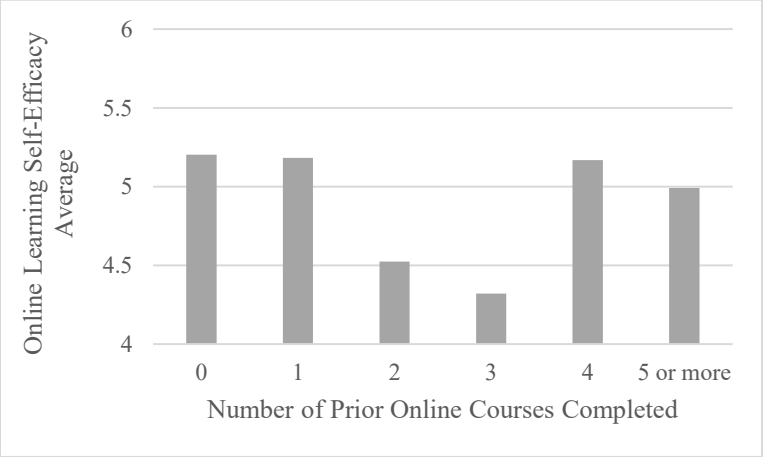

Figure 6. Online learning self-efficacy and prior online course experience.

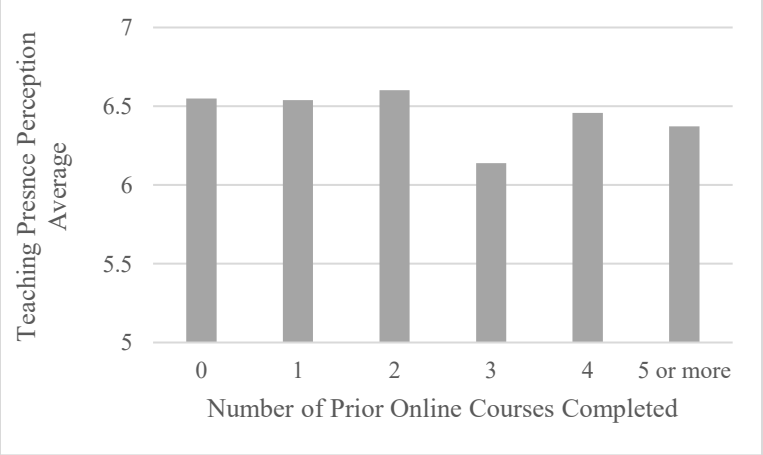

Figure 7. Teaching presence perception and prior online course experience.

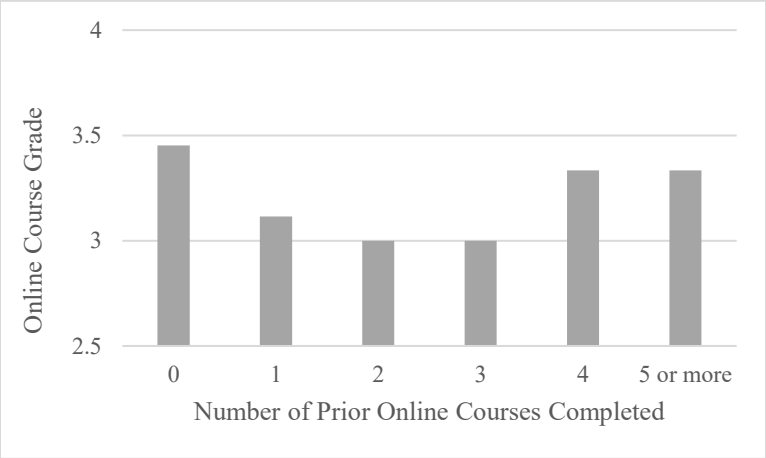

Figure 8. Current online course grade and prior online course experience. Current course grade is an average, reported in grade points, for the spring term of 2018.

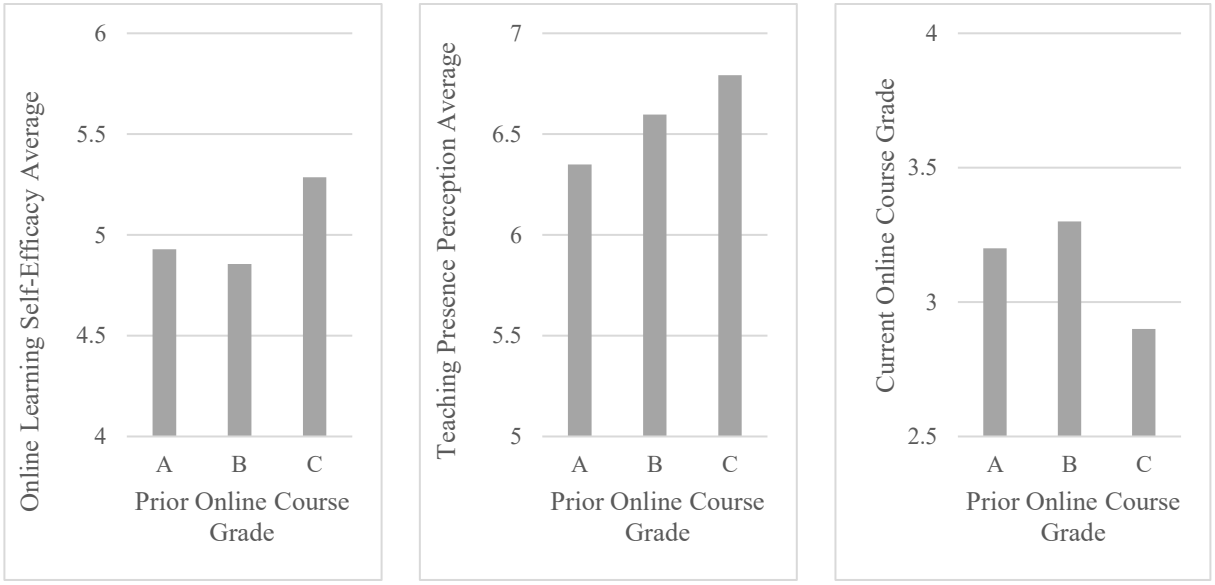

Figure 9. Online learning self-efficacy, teaching presence perception, and current online course grade by prior online course grade. Current course grade is an average, reported in grade points, for the spring term of 2018. Prior course grade is the grade earned in the most recent online course taken prior to enrolling in an online course at the graduate school.

Limitations

Limitations to the findings described in this chapter involve the modification of the survey. Although previous studies established the validity and reliability of the community of inquiry framework survey (Arbaugh et al., 2008) and the online learning self-efficacy scale

(Zimmerman & Kulikowich, 2016), some items in each survey were altered based on cognitive interviews, as was the response scale for the community of inquiry framework survey. Additionally, one item was removed from each survey. However, cognitive interviews improve the context-specific quality of the survey, increasing validity and reliability (Desimone & Le Floch, 2004). Furthermore, each subscale in the adapted questionnaire demonstrated strong reliability based on Cronbach's alpha scores above .80. Another potential limitation of the methods described above was the practitioner researcher's position as a dean at the institution. But, multiple safeguards, previously described, were taken to ensure participants did not feel coerced to participate or answer in specific ways.

Discussion

Although teaching presence and learner-instructor interactions were predicted to relate to the problem of practice, data from the needs assessment did not support a relationship. Responses on the teaching presence scale were high across all items; the average on the lowest-rated items was 6.4 out of seven, where six represented agree and seven represented strongly agree. There was not a significant difference in how students with low (i.e., < 3.00) and high undergraduate GPAs perceived teaching presence. For learner-instructor interactions, qualitative data indicated that both students with low and high undergraduate GPAs viewed their interactions with online instructors positively, mentioning only minor issues (e.g., a single email that got lost) when prompted to describe their least useful interactions with online instructors. Previous research conducted in online learning environments suggested that teaching presence may be difficult to establish in online courses (Baran et al., 2013; Bolldén, 2012; Downing & Dyment, 2013) and that weak learner-instructor interactions can negatively relate to outcomes for online students (Eom & Ashill, 2016; Jaggars & Xu, 2016). However, based on this needs

assessment, teaching presence and learner-instructor interactions appeared not to be issues at the graduate school of education in this study. One potential explanation for this is the regular synchronous instruction used at the graduate school. Regular synchronous classes, which provide online students at the graduate school of education with opportunities to interact with instructors via videoconference, may help to establish a strong sense of teaching presence as well as positive interactions between learners and instructors.

Like teaching presence and learner-instructor interactions, the predicted patterns related to previous online learning experience were not supported by the data. Prior online learning experience has been related to self-efficacy in online courses (Bradley et al., 2017; Jan, 2015; Shen et al., 2013; Zimmerman & Kulikowich, 2016), better use of learning strategies among online students (Wang et al., 2013), and stronger feelings of sense of community among online students (Shackelford & Maxwell, 2012b). However, based on this needs assessment, neither prior online course experience nor prior online course success (i.e., high grades) demonstrated any clear relationship to perceptions of teaching presence, online learning self-efficacy, or grades in current online courses. The lack of association between prior online learning experience and outcomes in the needs assessment might be explained by the fact that the needs assessment was conducted in the spring term at the graduate school of education and almost all students who participated would have also been enrolled in at least one online course in the fall term. Because data were anonymized an exact percentage of students who were enrolled in an online course the previous term could not be calculated, but it is rare for students to switch in or out of an online track at the institution between the fall and spring terms. Additionally, data were collected near the end of the spring term, so even students who were not enrolled in an online course in the fall term had months of experience in their current online courses. The questionnaire items asked

participants about experience in online courses prior to enrollment at the graduate school of education (e.g., in their undergraduate programs), so if there was any positive or negative impact associated with prior online experience, it may have attenuated by the time students were enrolled in their second term of online courses at the graduate school.

Data related to technology self-efficacy and interactions with technology in the online learning environment were more mixed. Although the difference in technology self-efficacy for online learning between students with low and high undergraduate GPAs was not significant, students with undergraduate GPAs under 3.00 did describe issues with technology in interviews. For example, some such students described a learning curve associated with technology early in the year and others noted struggles with technological complexity (e.g., multiple windows). These findings provide some evidence to support previous studies suggesting that technological complexity and student perceptions of technology as difficult to use can contribute to struggles among online learners (Falloon, 2012; Fleming, Becker, & Newton, 2017; Teo & Wong, 2013). However, technological struggles among online learners at the graduate school of education may be less relevant to the problem of practice than other factors because some students described only initial challenges with technology and there was no significant difference between the technology self-efficacy of students with undergraduate GPAs below 3.00 and students with higher GPAs.

The factor with the clearest relationship to students' undergraduate GPA at the graduate school of education was the time management component of online learning self-efficacy. This is perhaps unsurprising given that self-efficacy has been shown to relate to engagement (Pellas, 2014; Prior et al., 2016), academic outcomes (Joo et al., 2013; Wang et al., 2013) and satisfaction (Joo et al., 2013; Wang et al., 2013) in online courses. Needs assessment results

suggested that students with undergraduate GPAs below 3.00 at the graduate school of education had significantly lower self-efficacy related to time management in the online learning environment than students with higher GPAs. Students with low undergraduate GPAs also brought up time management struggles in interviews even though they were not explicitly prompted to do so. Although the needs assessment was designed with a multi-methods approach (e.g., an approach involving separate data sources to answer each research question without mixing of data), because time management came up in interviews, a mix of qualitative (i.e., from interviews) and quantitative (i.e., questionnaire results) data supported the conclusion that online students might benefit from a time management intervention.

Furthermore, male students demonstrated significantly lower time management self-efficacy than female students in online courses at the graduate school of education. This pattern also supports previous research suggesting that male students may struggle with online coursework (Cochran et al., 2014; Figlio et al., 2013; Xu & Jaggars, 2014) as compared to female students, offering a possible explanation for broader patterns noted in grades (Figlio et al., 2013; Xu & Jaggars, 2014) and retention (Cochran et al., 2014). Given the data suggesting time management skills and self-efficacy may be difficult for online students at the graduate school of education, and for students with low undergraduate GPAs and male students in particular, time management skills and time management self-efficacy in the online learning environment were prioritized for intervention in the context of the problem of practice.

Conclusion

A needs assessment of the problem of practice in context was conducted to determine the ways and extent to which learners' interactions with instructors and technology, learners' perceptions of teaching presence and self-efficacy, and learners' prior experience and success in

online courses related to the struggles experienced by students with low undergraduate GPAs in online coursework. Data were collected using a questionnaire, observations, and interviews. Secondary data from the graduate school's student information system was used to supplement collected data. Findings from the needs assessment indicated that time management skills and time management self-efficacy in the online learning environment caused challenges for all students and for students with low undergraduate GPAs and male students in particular. As a result, time management skills and time management self-efficacy were prioritized for intervention.

Chapter 3

Because students with low GPAs tend to earn lower grades in online courses than in face-to-face courses (Figlio et al., 2013; Xu & Jaggars, 2014) and also persist in online courses at lower rates than their peers (Cochran et al., 2014; Xu & Jaggars, 2014), a needs assessment was conducted with students taking online courses at a graduate school of education. The purpose of the needs assessment was to explore potential factors contributing to the struggles of students with low GPAs taking online courses, including learner-instructor and learner-interface interactions, teaching presence, online learning self-efficacy, gender, and prior online learning experience. The results of the needs assessment suggested that students in online courses at the graduate school of education could benefit from an intervention focused on time management.

Time management, meaning the choices made and actions taken by an individual when structuring and using time (Aeon & Aguinis, 2017), was not initially a construct of focus in the literature review or needs assessment beyond the time management subscale of Zimmerman and Kulikowich's (2016) online learning self-efficacy scale, which was used in the needs assessment. Questionnaire responses from 71 graduate students taking online courses indicated that they had lower self-efficacy related to time management for online learning as compared to self-efficacy for technology use or learning in the online environment. Additionally, students with undergraduate GPAs below 3.00 and male students had significantly lower perceptions of their own self-efficacy for time management in the online learning context than students with higher GPAs and female students respectively.

Interviews conducted with eight student volunteers as part of the needs assessment also suggested that students who had undergraduate GPAs under 3.00 struggled with time management in online courses. Although they were not specifically asked about time

management, two of the three students interviewed who had undergraduate GPAs below 3.00 brought up time management challenges on their own. In contrast, no students with undergraduate GPAs higher than 3.00 (n = 5) mentioned time management issues in interviews. Given that both questionnaire data and interviews suggested that time management may be a factor contributing to the struggles experienced by students with low GPAs taking online courses at the graduate school of education, time management was prioritized for intervention.

Theoretical Framework

Time management involves the choices made and actions taken by an individual and assumes agency on the part of the individual (Aeon & Aguinis, 2017). Based on the results of the needs assessment, an intervention was designed to support individual students with time management. Because time management is a self-directed individual behavior, a theoretical framework that positions students as individual agents of their own learning was used to frame the intervention. Self-regulated learning theory focuses on the beliefs and actions of students as individual learners (Zimmerman, 2002) and so was well suited to frame the intervention. Additionally, self-regulation may be critical for online learning in particular given the potential for distraction from non-learning technologies (e.g., social media) in the online environment (Lepp, Barkley, Karpinski, & Singh, 2019; Winter, Cotton, Gavin, & Yorke, 2010), and the degree of independent time management required by learners as they schedule and complete asynchronous online coursework (Bol & Garner, 2011).

Figure 10 shows the three phases that Zimmerman (2002) used to characterize the process of self-regulated learning. In the first phase, forethought, learners set goals and plan strategically. The beliefs of learners in the forethought phase relate to motivation and include self-efficacy beliefs (Zimmerman, 2002). In the next phase of Zimmerman's model,

performance, learners act on the strategies identified in the forethought phase and test different approaches. The third phase of Zimmerman's model for self-regulated learning is self-reflection. In this phase, learners assess performance relative to their goals and attribute causes to successes and failures. Learners then react to their assessments, taking either a defensive stance that involves retreating from learning to protect self-image (e.g., if the learner determines a failure is due to a lack of innate ability) or an adaptive stance that involves revision of strategies to improve approaches to learning.

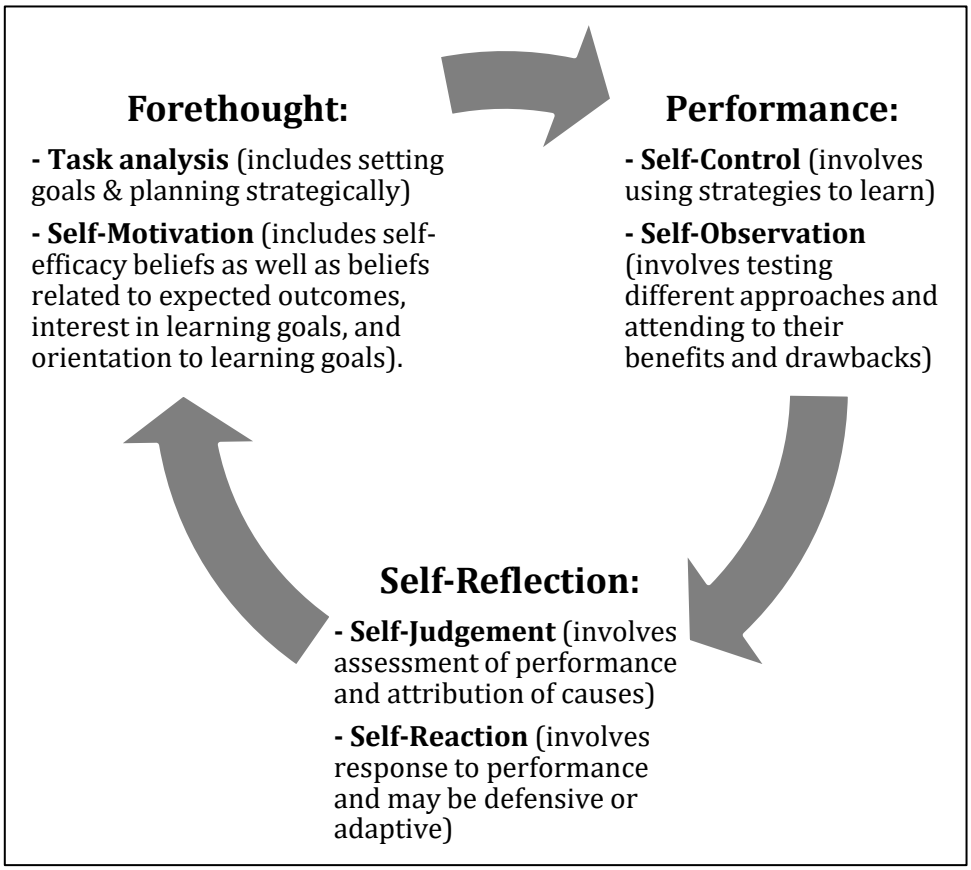

Figure 10. The self-regulated learning cycle. Adapted from "Becoming a Self-Regulated Learner: An Overview," by B. J. Zimmerman, 2002, Theory into practice, 41(2), p. 67.

As shown in Figure 10, Zimmerman's (2002) model of self-regulated learning is not linear, but rather cyclical. Learners return to the forethought phase after the self-reflection phase and earlier cycles of self-regulated learning impact subsequent cycles of self-regulated learning.

For example, if a learner has an adaptive reaction in the self-reflection phase, the learner may experience enhanced self-motivation in the forethought phase due to positive beliefs about expected outcomes related to refined learning strategies. On the other hand, if the learner has a defensive reaction in the self-reflection phase, they may experience the opposite impact on self-motivation in the forethought phase and set lower learning goals for themselves as a result.

The self-reflective learning cycle relates to both time management skills and time management self-efficacy. Self-efficacy refers to individuals' beliefs about their abilities to perform specific tasks (Bandura, 1977). An individual with strong self-efficacy related to time management, therefore, can be assumed to believe that they can manage time successfully. Time management skills, on the other hand, are observable actions such as setting goals, organizing time, and prioritizing time (Macan, 1994). Because the proposed intervention will target both improved time management self-efficacy and improved time management skills, it interacts with Zimmerman's (2002) self-regulated learning model in the forethought and performance stages. According to Zimmerman's model, in the forethought stage, improved self-efficacy related to time management for online learning should connect to enhanced self-motivation for time management in the online learning environment. Goal setting and strategic planning, which make up the task analysis component of the forethought phase (Zimmerman, 2002) overlap with time management skills such as time allocation for tasks and prioritization. Furthermore, in the performance phase of Zimmerman's model, learners must take action on planned strategies, which requires the time management skill of following through on plans for time use.

Time management self-efficacy and skills theoretically relate to self-regulated learning as described above. Additionally, empirical work by researchers such as Oettingen, Kappes, Guttenberg, and Gollwitzer (2015) and Schippers, Scheepers, and Peterson (2015) has related

time management to self-regulated learning. Oettingen et al., for example, experimentally demonstrated a relationship between the "self-regulation strategy of selective goal pursuit" (p. 218) and improved time management among undergraduate students in both Germany and the United States as well as among working mothers taking a business course in New York City. Similarly, Schippers et al. found that among Dutch business students who participated in a goal setting intervention, subgroup differences (e.g., between male and female students) in the scheduling of important exams were eliminated. The authors reasoned that because students could choose when to take important exams required for diploma attainment within a certain range of time, the goal setting intervention may have reduced procrastination among students who would have likely put off the scheduling of exams until later in the program without the intervention (Schippers, Scheepers, & Peterson, 2015).

Finally, some research treats time management explicitly as a dimension of self-regulated learning. In their meta-analysis of peer-reviewed literature on self-regulated learning and outcomes in online higher education courses, Broadbent and Poon (2015) identified time management as a self-regulated learning strategy. Furthermore, the meta-analysis demonstrated a significant positive relationship between time management skills and academic achievement in online courses (Broadbent & Poon, 2015). However, the magnitude of the relationship was weak.

Since Broadbent and Poon's meta-analysis, two additional studies conducted with online learners have situated time management as a self-regulated learning strategy and demonstrated a relationship between time management and course success. First, Kizilcec, Pérez-Sanagustín, and Maldonado (2017) surveyed 4,831 students enrolled in Massive Open Online Courses (MOOCs) offered through Coursera by a Chilean university. Analysis of survey results indicated that students' use of goal setting and strategic planning strategies (i.e., time management relative

to goals) predicted attainment of personal course goals such as earning a certificate by completing the course (Kizilcec, Pérez-Sanagustín, & Maldonado, 2017). However, students taking online MOOCs may differ from those taking for-credit online courses in several ways, including motivation (Christensen et al., 2013). But, Broadbent (2017) demonstrated similar results in a traditional higher education environment. In a study involving 606 students at the University of Melbourne, Broadbent used the Motivated Strategies for Learning Questionnaire, a measure of self-regulated learning (Pintrich, Smith, Garcia, & McKeachie, 1991), to investigate factors related to success in online and blended courses. Analysis of survey responses and course grades indicated that the use of time management strategies positively related to course grades (Broadbent, 2017). Given the theoretical and empirical relationships between self-regulated learning and time management, the proposed intervention was designed to improve time management self-efficacy and skills among students taking online courses at the graduate school of education in order to positively influence the self-regulated learning cycles described by Zimmerman (2002).

Synthesis of Intervention Literature

Several types of interventions designed to improve time management have been tested in higher education settings. Interestingly, interventions that seem most directly relevant to time management, such as time management training or deadline reminders, exhibit mixed evidence for positive impact (Aeon & Aguinis, 2017; Damgaard & Nielson, 2018). However, other interventions, such as mental contrasting with implementation intentions (e.g., Oettingen, Kappes, Guttenberg, & Gollwitzer, 2015) and one-to-one coaching (e.g., Bettinger & Baker, 2014) may be more promising in terms of impact on time management and academic outcomes in higher education settings. The following sections review different interventions tested in

higher education settings relevant to time management, and therefore, by association, time management self-efficacy.

Time Management Training

Typical time management interventions are those that involve training on time management skills such as calendaring (i.e., planning to complete tasks at specific times and recording this on a calendar). Such time management trainings fit within the forethought phase of Zimmerman's (2002) cyclical model of self-regulated learning given that they emphasize strategic planning. However, although time management training interventions may improve participants' sense of well-being, they demonstrate mixed results in terms of impacting outcomes like performance at a job or in school (Aeon & Aguinis, 2017), indicating that such training may be insufficient to influence the performance phase of self-regulated learning. Additionally, many time management interventions are conducted in employment rather than academic contexts (Aeon & Aguinis, 2017). However, a recent series of studies in Germany investigated the impact of time management training in higher education.

Two of the three studies investigated the relationship between time management training and participants' perceptions. First, one study randomly assigned 177 freshmen at a German university into treatment and control groups and used a pretest posttest design to measure the impact of a time management training on students' perceptions of time management demands, control over time, and perceived stress (Häfner, Stock, Pinneker, & Ströhle, 2014). The time management training involved goal setting (i.e., defining an intention to achieve a certain outcome), progress monitoring relative to goals, prioritization (e.g., looking at a list of tasks to be accomplished and choosing the ones to take on in a day), and planning (e.g., allocating time in a day to specific tasks). Participation in the training mitigated the increased perceptions of time

management demands and perceived stress in the beginning of the semester experienced by participants assigned to the control group. Participants assigned to the time management training also experienced an increase in perceived control of time following the training (Häfner, Stock, et al., 2014). In a different study that used a similar time management training with 23 students at a German university, Häfner, Stock, and Oberst (2015) found that participation in the training increased perceived control of time and decreased perceived stress among participants.

The third study conducted in the German higher education context (Häfner, Oberst, & Stock, 2014) differed from the two previously described because the authors investigated behaviors rather than perceptions. Häfner, Oberst, and Stock (2014) implemented a time management training that included practice of time management skills with 45 German undergraduate students. Students volunteered to participate and then were randomly assigned to the intervention treatment or a control group. Students in the control group procrastinated more (i.e., spent significantly more time on a task the week before the deadline) than students in the treatment group (Häfner, Oberst, & Stock, 2014). However, there was no difference in the overall time spent on an academic task between participants assigned to the treatment and control groups. Furthermore, the study initially involved 96 volunteer participants, but 51 were excluded from analysis based on missing data (e.g., failure to report time spent in a given week; Häfner, Oberst, & Stock, 2014). Overall, although the studies conducted by Häfner and colleagues yielded some promising results, the findings were stronger for the impact of time management training on student perceptions related to time management than for their impact on student time management behavior.

Despite the positive results associated with time management training in the work of Häfner and colleagues (Häfner, Oberst, & Stock, 2014; Häfner, Stock, et al., 2014: Häfner,

Stock, & Oberst, 2015), other research on time management training in higher education settings has demonstrated conflicting results. In a study conducted with 118 undergraduate and graduate students from two universities in the United States, Glick and Orsillo (2015) compared a training focused on time management (e.g., strategies for limiting procrastination) with a training designed to help students use acceptance and mindfulness strategies to mitigate time-related stress and procrastination. Trainings were administered via video early in the semester, and participants were randomly assigned to one of the two conditions. About two-thirds of the way through the semester, participants reported on their own procrastination via questionnaire. No significant differences in procrastination were revealed between students who participated in the time management intervention and those who participated in the acceptance and mindfulness intervention (Glick & Orsillo, 2015). Additionally, a large randomized control trial involving online students conducted by Oreopoulos, Patterson, Petronijevic, and Pope (2018; described in more detail later) demonstrated no effects associated with an intervention that combined time management training with reminders.

Notably, Oreopoulos et al.'s (2018) study included more than 6,000 online students and more than 9,000 total students, whereas the largest number of participants in the three studies conducted by Häfner and colleagues was 177 (Häfner, Stock, et al., 2014), making Oreopoulos et al.'s findings more likely to be generalizable. Furthermore, the studies conducted by Häfner and colleagues measured outcomes after a maximum duration of four weeks (Häfner, Oberst, & Stock, 2014; Häfner et al., 2015). In contrast, Glick and Orsillo (2015) measured outcomes after approximately two-thirds of a semester, and Oreopoulos et al. measured outcomes after a semester or longer. Therefore, it is possible that the positive outcomes noted in the studies by Häfner and colleagues (Häfner, Oberst, & Stock, 2014; Häfner, Stock, et al., 2014: Häfner et al.,

2015) were time-limited. However, the intervention administered by Glick and Orsillo, as well as the training portion of the intervention administered by Oreopoulos et al., were asynchronous, whereas the interventions administered by Häfner and colleagues were live (Häfner, Oberst, & Stock, 2014; Häfner, Stock, et al., 2014: Häfner et al., 2015). Therefore, it is also possible that live time management training is more effective than asynchronous training. That said, given the overall mixed evidence associated with time management training, direct training on time management was not likely the most effective intervention to pursue. An intervention that impacts both the forethought phase of self-regulated learning, where self-efficacy is situated, and the performance phase of self-regulated learning, where behavior is situated (Zimmerman, 2002), was better suited to impact both time management self-efficacy and time management skills.

Nudges

A nudge, as defined in behavioral economics, is a small change to the environment that influences but does not force an individual's decision-making (Thaler & Sunstein, 2008). For example, a text message reminding a student of an upcoming deadline constitutes a nudge designed to influence that student's time management choices. Nudges, therefore, are designed such that they should influence the performance phase of Zimmerman's (2002) model of self-regulated learning, for example by directing attention (Sunstein, 2014). Like time management training, nudges demonstrate mixed impact on time management (Damgaard & Nielson, 2018). In their review of literature related to nudges in educational contexts, Damgaard and Nielson (2018) concluded that reminder-based nudges (e.g., text message deadline reminders) in higher education likely work best as interventions related to one-time actions such as college enrollment or completion of financial aid applications, but may not influence ongoing behavior change, such as would be required for improvement of time management in the online learning environment.

Some positive evidence for the impact of reminder-based nudges does, however, exist. In a study involving 1,198 college students in West Virginia, Castleman and Meyer (2016) investigated the impact of text message nudges. In the study, students who participated in a college-access program for low income students in high school and agreed to receive text message nudges in college received messages approximately one to four times a month. The text messages included reminders as well as information and encouragement on topics such as course registration and tutoring resources. Compared to students who did not receive the nudges, treated students tended to attain more credits in their first year of college (Castleman & Meyer, 2016).

However, other studies of nudges in academic settings have not demonstrated the same impact. For example, Kizilcec, Pérez-Sanagustín, and Maldonado (2016) conducted an experiment by randomly assigning 653 students in a MOOC to either receive or not receive a nudge in the form of self-regulated learning study tips. The study tip nudge had no impact on the number of video lectures watched or number of assessments passed by students (Kizilcec, Pérez-Sanagustín, & Maldonado, 2016). Similarly, the study conducted by Oreopoulos, Patterson, Petronijevic, and Pope (2018; described in more detail in the next section) combined time management training with nudges and found no impact associated with the intervention. A similar study by Oreopoulos and Petronijevic (2018; described in more detail in the one-to-one coaching section) found no impact associated with an intervention that combined goal setting and nudges. Given that multiple studies have demonstrated no impact associated with nudges (Kizilcec et al., 2016; Oreopoulos, Patterson, Petronijevic, & Pope, 2018; Oreopoulos & Petronijevic, 2018), nudges may not yield results if applied as an intervention related to time management. That is, they may be ineffective for promoting actions in the performance phase of self-regulated learning (e.g., the demonstration of improved time management skills).

Time Management Training Combined with Time Management Nudges

Combining time management training with nudges might be a theoretically promising intervention given the combination of a strategy that could plausibly influence the forethought phase of self-regulated learning (i.e., training) and a strategy that could plausibly influence the performance phase of self-regulated learning (i.e., nudges). However, empirical tests have again yielded less than promising results. Although research such as that conducted by Castleman and Meyer (2016), Häfner, Oberst, and Stock (2014), Häfner, Stock, and Oberst (2015), and Häfner, Stock, Pinneker, and Ströhle (2014) suggests that nudges and time management training may be helpful to students in some higher education settings, a large study with an intervention that combined both time management training and nudges in an online learning environment demonstrated no impact of the intervention (Oreopoulos et al., 2018). Specifically, Oreopoulos et al. (2018) designed a randomized control trial in which 6,065 online students at Western Governors University in the United States participated. Most (i.e., 75%) participants were employed full time, making them similar to students enrolled at the graduate school in this study. Those not assigned to the control group participated in a single online module on planning time. Following the training, participants received web-based and text reminders about upcoming coursework benchmarks and planned study events. The reminders were timed based on benchmarks that participants set for themselves and added to individual electronic calendars. The intervention had no effect on the time it took students to earn their first academic credit, no effect on use patterns in the online learning management system (i.e., weekly number of logins to the school's online portal; number of mouse moves, clicks, and page scrolls when logged in), and no effect on retention (Oreopoulos et al., 2018). Given the similarities in context between that in Oreopoulos et al.'s study and the graduate school in this study, as well as overall mixed evidence

regarding the effectiveness of time management training (Aeon & Aguinis, 2018) and nudges (Damgaard & Nielson, 2018), a different type of intervention was likely to be more relevant at the graduate school.

Goal-based Interventions

Goal setting is explicitly included in the forethought phase of Zimmerman's (2002) model of the self-regulated learning cycle. Several types of interventions related to goals have been tested in higher education settings. Such interventions include commitment devices (e.g., Anderberg, Cerrone, & Chevalier, 2017; Patterson, 2018), goal setting (Anderton, 2006; Morisano, Hirsh, Peterson, Pihl, & Shore, 2010; Oreopoulos et al., 2018; Oreopoulos & Petronijevic, 2018), and mental contrasting with implementation intentions (e.g., Oettingen et al., 2015; Saddawi-Konefka et al., 2017). The sections that follow explore each of these categories of goal-based intervention.

Commitment devices. Commitment devices are tools or strategies designed to help individuals follow through on future plans that they might find difficult or unpleasant in the present (e.g., exercise or studying). Examples of commitment devices include choices to incur a penalty (e.g., financial or grade-based) if a future commitment is broken; planning to engage in a future commitment with another individual (i.e., such that a social penalty is incurred if the commitment is broken); combining difficult or unpleasant future commitments with more desirable actions (e.g., television watching); or simply explicitly defining the commitment (Anderberg et al., 2017; Rogers, Milkman, & Volpp, 2014). Because commitment devices involve defining one's own desired actions in the future, they involve setting and committing to small goals, and can be situated with goal setting in the self-regulated learning cycle. And, because commitment devices aim to promote time spent on a specific task in the future, they also

relate to time management as well as to follow through on planned behavior in the performance phase of the self-regulated learning cycle. However, as with evidence for time management training and nudges, the evidence for the impact of commitment devices is mixed.

Commitment devices have been tested in both MOOCs, which are relevant to this study's context given that they are online courses, and in more traditional higher education settings. Evidence of impact in both settings is mixed. In a randomized control trial conducted with 637 volunteer participants enrolled in statistics MOOC, Patterson (2018) tested commitment devices that allowed participants to set a daily goal for the maximum amount of time spent on distracting websites. After an individual reached their time limit for a day, distracting websites were blocked and could only be unblocked individually by participants, who had to provide a reason for doing so. Compared to other tested interventions (i.e., alerts and distraction blockers), as well as compared to a control group, the commitment device positively impacted outcomes including time spent in the MOOC, assignment submission, grades, and course completion (Patterson, 2018). On the other hand, a scheduling-based commitment device tested in a MOOC by Baker, Evans, and Dee (2016) demonstrated no to negative impacts on measured outcomes. In this study, 18,043 students enrolled in a science MOOC on Coursera were randomly assigned to a treatment or control group (Baker, Evans, & Dee, 2016). Treated individuals were asked to fill out a survey at the beginning of both the first and second week of the MOOC indicating the day and time at which they would watch the first lecture video of the week. Compared to participants assigned to the control group, participants who completed at least one such survey demonstrated no differences in whether or not they watched the lecture videos. Furthermore, the treatment, to the surprise of the researchers who designed the treatment with the intent that it would positively

impact outcomes, had a negative effect on course completion, course grade, and total number of videos watched in the course (Baker et al., 2016).

Although studies on MOOCs such as those conducted by Patterson (2018) and Baker et al. (2016) are relevant to the context of the problem of practice given the online context, MOOCs are not typically offered for credit and the motivations of learners in MOOCs can differ from students enrolled in for-credit courses (Christensen et al., 2013). However, as found in studies conducted in MOOCs, studies conducted in more traditional higher education settings demonstrate mixed evidence regarding the effect of commitment devices. In an experiment that demonstrated positive results, Himmler, Jaeckle, and Weinschenk (2017) randomly assigned 392 students taking statistics at a German university to one of three conditions: a control condition, a reminder-based nudging treatment, and a commitment device treatment. The commitment device in this study involved students signing a non-binding statement affirming that they would follow a recommended exam schedule. Although the reminder treatment demonstrated no impact, the commitment device treatment had a positive effect on students prone to procrastination in terms of the number of exams they signed up for, took, and passed (Himmler, Jaeckle, & Weinschenk, 2017).

Despite the positive evidence from Himmler et al.'s (2017) research on commitment devices, other studies conducted in higher education settings lack positive results. For example, Baker, Evans, Li, and Cung (2018) tested a similar commitment device to that tested in the MOOC environment by Baker et al. (2016; i.e., email prompts to schedule the watching of video lectures) and again found a potential negative impact of the intervention. In their test involving students enrolled in a for-credit summer course at a public institution of higher education, Baker et al. (2018) randomly assigned 145 participants to either receive the commitment device survey

or to a control group. Although students who completed the commitment survey regarding video watching had higher quiz scores in the first week of the course than students in the control group, by the end of the course, the impact of the commitment device on quiz grades trended negative, though the findings were not significant. Furthermore, the researchers found no difference between the treatment and control groups in terms of procrastination, as measured by the tendency to watch multiple lecture videos at a time rather than in a spaced out fashion (Baker, Evans, Li, & Cung, 2018). Similarly, Anderberg, Cerrone, and Chevalier (2017) found that a commitment device that involved specifying a self-imposed deadline had no impact on grades among university students in London when comparing a cohort of students (n = 263) who had the opportunity to participate in the intervention with an untreated cohort. In fact, Anderberg et al. found "a remarkably high failure to comply with the chosen commitment" (p. 1140). Based on research in MOOC (Baker et al., 2016; Patterson, 2018) and traditional higher education settings (Anderberg et al., 2017; Baker et al., 2018; Himmler et al., 2017), there is, at best, mixed evidence for the positive effect of commitment devices, with two studies (Baker et al., 2016; Baker et al., 2018) suggesting a potential negative effect of commitment devices.

Goal setting. In self-regulated learning, goal setting is tied to strategic planning (Zimmerman, 2002), and so can drive time management. Like the studies on time management training, nudges, and commitment devices, studies on goal setting interventions have also yielded mixed results. In a study involving 85 Canadian undergraduate students with GPAs below 3.00, 45 students randomly assigned to participate in a goal setting training earned higher GPAs and were retained at a higher rate than students in the control group after the intervention (Morisano et al., 2010). This study is of particular interest given its focus on students with low

GPAs; however, Oreopoulos and Petronijevic (2018) piloted the same intervention with randomly assigned college students and found no impact associated with the intervention.

Another goal setting intervention associated with positive outcomes was conducted by Anderton (2006), who used a quasi-experimental design in which one section of a class participated in a goal setting intervention along with follow up weekly self-reports on progress and the other section of the same class did not. Participation in the intervention related positively to students' perceptions of their own use of self-regulated learning strategies but did not demonstrate a relationship with student grades (Anderton, 2006). Like Morisano, Hirsch, Peterson, Pihl, and Shore's (2010) study, Anderton's study is of particular interest based on the participants, who were 28 students taking an online teacher education course (Anderton, 2006). But, Oreopoulos et al.'s (2018) research, which involved online students at Western Governors University, demonstrated no impact of a time management intervention that included goal setting regarding use of time. Similarly, Oreopoulos and Petronijevic (2018) found no impact of an online goal setting intervention used by itself. Therefore, although some promising evidence exists about the impact of goal setting interventions in contexts with similarities to this study (i.e., Anderton, 2006; Morisano et al., 2010), other research (i.e., Oreopoulos & Petronijevic, 2018) demonstrates conflicting results, including research (i.e., Oreopoulos et al., 2018) in similar contexts.

Mental contrasting with implementation intentions. Goal setting interventions on their own demonstrate some promise, but the evidence is not strong. Mental contrasting with implementation intentions (MCII), which involves particular goal setting and planning strategies, and therefore can also be situated in the forethought phase of Zimmerman's (2002) self-regulated learning cycle, may be especially useful for improving the time management skills and time

management self-efficacy of graduate students taking online courses. MCII interventions have been successfully applied to promote a variety of positive behaviors including healthy eating habits (Adriaanse et al., 2010; Stadler, Oettingen, & Gollwitzer, 2010), physical activity (Christiansen, Oettingen, Dahme, & Klinger, 2010; Stadler, Oettingen, & Gollwitzer, 2009), collaborative negotiation of car sales (Kirk, Oettingen, & Gollwitzer, 2013), reduction in behaviors associated with insecurity in personal relationships (Houssais, Oettingen, & Mayer, 2012), and engagement in academic behaviors involving self-regulation among children (Duckworth, Grant, Loew, Oettingen, & Gollwitzer, 2011; Gawrilow, Morgenroth, Schultz, Oettingen, & Gollwitzer, 2013). An MCII intervention has also demonstrated a positive impact on grades among middle school students (Duckworth, Kirby, Gollwitzer, & Oettingen, 2013). The sections that follow provide an overview of mental contrasting and of implementation intentions separately, followed by a section focused on MCII interventions (i.e., studies that apply both mental contrasting and implementation intentions) in higher education contexts.

***Mental contrasting*.** The mental contrasting (MC) portion of MCII involves people imagining, in detail, the attainment of desired goals in the future and comparing this vision to current realities, which are framed as obstacles (Oettingen, 2012). Mental contrasting also may interact with outcome expectations, another part of the forethought phase of self-regulated learning (Zimmerman, 2002). In an experiment conducted with 184 German university students and that used reaction time to measure association between sets of words, Kappes, Singmann, & Oettingen (2012) demonstrated that when participants' expectations for their own ability to achieve their desired outcomes were high, an MC intervention strengthened associations between obstacles and the behaviors that could be used to overcome them. But, when participants'

expectations for their ability to achieve desired outcomes were low, this was not the case (Kappes, Singmann, & Oettingen, 2012).

Similarly, Kappes, Wendt, Reinelt, and Oettingen (2013) investigated the impact of MC on participants' evaluation of potential obstacles as positive or negative. For example, an invitation to a party might be evaluated by some individuals as positive (e.g., as an opportunity to socialize) and by others as negative (e.g., as an obstacle standing in the way of academic success; Kappes et al., 2013). Using a randomized control methodology, Kappes et al. (2013) found a similar pattern to that established by Kappes et al. (2012). Specifically, participants who participated in an MC intervention and had high expectations for their ability to achieve a goal had more negative associations with obstacles and more readily identified obstacles to goal attainment than participants assigned to a control group. As with the previous study, the pattern did not hold among participants with low expectations for their ability to achieve the goal (Kappes et al., 2013). Taken together, the studies by Kappes et al. (2012) and Kappes et al. (2013) indicate that participants' expectations of success should be carefully considered in any intervention using MC. The two studies also suggest that MC may work by helping participants identify obstacles and implement behavior to overcome the obstacles with less mental strain than might be required in the absence of an MC exercise (Kappes et al., 2012; Kappes et al., 2013). The connection between MC and behavior suggested by these studies also lends support to a connection between forethought in the self-regulated learning cycle (i.e., goal setting and outcome expectations; Zimmerman, 2002) and performance in the self-regulated learning cycle.

Implementation intentions. The implementation intentions (II) portion of MCII involves people creating if-then statements to plan for how to overcome potential obstacles that may arise on the path to goal attainment (Oettingen, 2012). In this way, the goal setting and strategic

planning components of the forethought phase of self-regulated learning (Zimmerman, 2002) are connected when MC and II are combined. Similar to the way the work of Kappes et al. (2012) and Kappes et al. (2013) sought to explain how MC works to influence behavior, Adriaanse, Gollwitzer, De Ridder, de Wit, and Kroese (2011) conducted an experiment designed to help explain how II works to influence behavior. They had participants, 75 female European university students, randomly assigned to a treatment or control group, and all participants were asked to identify a situation (e.g., watching television) associated with snacking, as well as a healthier snack that they would like to eat when in the identified situation. Participants assigned to the control group reacted more quickly to their habitual (i.e., less healthy) snacks than to their healthy snack choice based on a word recognition test. However, participants assigned to the II treatment reacted more quickly to the healthy snack choice, though the difference between reaction times associated with habitual and healthy snacks was not significant (Adriaanse, Gollwitzer, De Ridder, de Wit, & Kroese, 2011). Because of their findings, Adriaanse et al. (2011) concluded that II might work to influence behavior by making alternative, desired choices as easily mentally accessible as undesired choices in a given situation. As with the work suggesting a link between MC and behavior (Kappes et al., 2012; Kappes et al., 2013), Adriaanse et al.'s work also suggests a link between the forethought and performance phases of self-regulated learning by connecting II to in-the-moment reactions related to desired behaviors.

In another study focused on II only, Seo, Patall, Henderson, and Steingut (2018) ran a series of experiments with 452 students taking psychology courses at a large university in the United States to determine whether an II intervention could make self-determined goals as effective as assigned goals in terms of outcomes such as goal commitment and effort. They determined that an II intervention could indeed enhance commitment and effort for self-set goals

relative to assigned goals (Seo, Patall, Henderson, & Steingut, 2018). This finding is relevant because self-set goals allow for choice, which can enhance intrinsic motivation (Ryan & Deci, 2000). Furthermore, the findings indicate that II may strengthen the application of MC in situations in which the chosen goal is self-selected.

MCII interventions. Interventions including MCII in higher education settings have demonstrated effectiveness relevant to time management in multiple instances. In three studies focused on MCII and time management, Oettingen et al. (2015) found MCII interventions to be effective in a variety of settings. First, in a randomized control trial involving 84 undergraduates at a German university, participants who received the MCII intervention scheduled more hours for planned activities on a calendar than students in control groups (Oettingen et al., 2015). Next, Oettingen et al. conducted another randomized control trial, this time with 40 students at a university in the United States. The students who received the intervention practiced applying MCII in different scenarios and were instructed to try using MCII once a day on relevant problems during the upcoming week. The intervention significantly impacted students' self-perceived time management as measured by comparing pretest with posttest questionnaires. In contrast, students in the control group did not experience any improvements in their self-perceptions of time management. Finally, Oettingen et al. tested the impact of an MCII intervention with 58 female students taking a vocational business course in New York City, again using a randomized control trial. Although students with jobs or children attended class less than other students, the intervention moderated the negative relationship between working hours, children, and attendance for working mothers (Oettingen et al., 2015).

Similarly, Saddawi-Konefka et al. (2017) tested MCII with medical residents, comparing the impact of the MCII intervention to a simple goal setting intervention in a single-blind cluster

randomized study. Compared to the 18 residents who received the simple goal setting intervention, the 16 who received the MCII intervention spent more time studying toward a specific goal (e.g., studying a chosen topic such as sepsis), although time was measured via self-report (Saddawi-Konefka et al., 2017). Residents who participated in the MCII intervention experienced no significant increases in self-perceptions of time management over the course of the trial, but those who participated in the simple goal setting intervention experienced decreased self-perceptions of time management over the course of the trial (Saddawi-Konefka et al., 2017). One interpretation of the results is that participation in MCII mitigated the negative impact that combining high-stress employment with academic work can have on perceptions of time management.

The positive impact of an MCII intervention on academic outcomes was also demonstrated in the context of two MOOCs studied by Kizilcec and Cohen (2017). The researchers randomly assigned 17,963 volunteer participants to an MCII treatment or a control group and measured course completion as the dependent variable. Although they found that MCII had a positive effect on course completion, this effect was only found to apply to students from countries with individualist cultures (e.g., the United States) and not to students from countries with collectivist cultures (e.g., China). Furthermore, among students from individualist countries, MCII only had an impact when participants identified obstacles related to everyday obligations such as work or family responsibilities (e.g., as compared to practical obstacles such as Internet access; Kizilcec & Cohen, 2017).

Last, a recent study by Schippers et al. (2015) included an intervention that involved comparing a desired future to a "counter-vision" (p. 3) of the future as well as planning for how to achieve the desired future rather than the counter-vision, which the authors referred to as MCII

in their supplementary materials. Students who participated in the intervention, who consisted of 659 students in one year's cohort at the Rotterdam School of Management in the Netherlands, also had their photographs taken and displayed, along with a goal statement, as part of the intervention. Compared to three other cohorts of students who did not receive the intervention (*n* = 2,220), gaps in the number of credits earned and retention rates between males and females closed, and those between ethnic minorities in the Netherlands and other students narrowed (Schippers, Scheepers, and Peterson, 2015).

MCII interventions share some similarities to the goal setting interventions described in the previous section, and therefore not all evidence is unambiguously positive. For example, Shippers et al. (2015) included in their goal setting intervention steps that were "virtually identical" (p. S1) to those in the intervention tested by Morisano et al. (2010). The intervention tested by Morisano et al. included imagining a desired future, identifying obstacles that might stand in the way of that future, and planning to overcome these obstacles, thus sharing many characteristics with MCII exercises. Although the intervention was associated with positive outcomes in Morisano et al.'s study, the same intervention tested by Oreopoulos and Petronijevic (2018) did not demonstrate a positive effect.

Despite some conflicting evidence from goal setting interventions similar to MCII, given the success of MCII interventions for time management (Oettingen et al., 2015; Saddawi-Konefka et al., 2017) and academic outcomes (Kizilcec & Cohen, 2017; Schippers et al., 2015), MCII may be an effective intervention for improving the time management skills and time management self-efficacy of students taking online courses. Additionally, Oettingen et al.'s (2015) intervention and Saddawi-Konefka et al.'s (2017) interventions were particularly relevant due to their inclusion of students with jobs, because all students in this study were employed.

Similarly, Schippers et al.'s (2015) work is of particular interest in the context of this study given that male students who participated in the needs assessment had significantly lower levels of online learning self-efficacy related to time management than female students, and the intervention tested by Schippers et al. closed gaps in academic outcomes between male and female students. Last, though perhaps less relevant to a graduate school setting given the MOOC context, the positive findings of Kizilcec and Cohen (2017) were promising for the potential impact of an MCII intervention in this study given the online context of the study and because the graduate school is located in the United States (i.e., an individualist culture in which Kizilcec and Cohen demonstrated impact of MCII).

One-on-one Coaching

One-to-one coaching in higher education involves a coach who supports an individual student to develop attitudes and skills relevant to academic success such as balancing personal and school commitments (Bettinger & Baker, 2014). Depending on its design, one-to-one coaching could intersect with any of the phases of self-regulated learning (i.e., forethought, performance, or self-reflection; Zimmerman, 2002). Using time management as an example, coaches might provide feedback on strategic plans for the use of time in the forethought phase, ask students to try out different time management strategies in the performance phase, or self-evaluate their own use of time compared to their planned use of time in the self-reflection phase.

Like MCII, one-to-one coaching interventions have demonstrated effectiveness in higher education settings. For example, although Oreopoulos and Petronijevic's (2018) study did not demonstrate any impact associated with a goal setting intervention on its own, when goal setting was combined with one-to-one coaching, the results were more positive. Specifically, 24 students randomly selected to receive a goal setting intervention in addition to one-on-one

coaching from other students farther along in their college trajectories experienced significant positive effects on course grades and overall GPAs. Similarly, Bettinger and Baker (2014) demonstrated that one-to-one phone-based coaching had significant positive effects on retention measured at multiple points in time among 8,049 students randomly assigned to be coached at multiple public, private, and for-profit institutes of higher education. The positive effects were more pronounced for male students, which is again relevant to the intervention at the graduate school in this study based on the needs assessment findings that male students had lower time management self-efficacy for online learning than female students. Given this and the success of one-to-one coaching in a variety of higher education settings (Bettinger & Baker, 2014; Oreopoulos & Petronijevic, 2018), although the coaching interventions described here did not target time management specifically, the inclusion of one-to-one coaching in a time management intervention might increase its likelihood of success.

Proposed Intervention

The proposed intervention in this study aimed to improve the time management self-efficacy and skills of students taking online courses at a graduate school of education, thus impacting time management in the forethought and performance phases of self-regulation. Based on the success of MCII interventions in MOOC and higher education settings (Kizilcec and Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2015), the intervention in this study included regular MCII exercises across a term. Although one-to-one coaching demonstrated promise for improving higher education outcomes like grades and retention (Bettinger & Baker, 2014; Oreopoulos & Petronijevic, 2018), because research connecting one-to-one coaching to time management skills or self-efficacy was lacking, one-to-one coaching was not included in the proposed intervention. Furthermore, focusing the intervention on MCII allowed for stronger

inferences to be drawn about the specific relationship between MCII and online students' time management skills and time management self-efficacy.

Goal setting (e.g., when participants imagine a goal and associated outcomes during MCII) and strategic planning (e.g., when participants identify obstacles and plan to overcome them during MCII), as part of the forethought phase of self-regulated learning, sets the stage for intentional actions in the performance phase of self-regulated learning (Zimmerman, 2002). MCII exercises also promote action (e.g., follow through on planned actions to overcome an obstacle that may arise in pursuit of a goal) in the performance phase. To support the MCII exercises that were implemented throughout the term, students receiving the intervention also participated in a goal setting activity at the beginning of the term, which was designed based off the one used by Schippers et al. (2015), which in turn included components similar to Morisano et al.'s (2010) goal setting intervention. For MCII activities to be successful, goals should be desirable (Oettingen, 2012) and feasible for participants (Kappes et al., 2012; Kappes et al., 2013). As such, the initial goal setting activity was designed to promote desirability and feasibility, and students were asked to refer back to this goal setting activity at the beginning of each subsequent MCII exercise. Based on this design, it was hypothesized that the intervention would improve the time management self-efficacy and time management skills of students taking online courses at the graduate school of education.

Chapter 4

A needs assessment was conducted at the graduate school of education to determine factors that contributed to the grades and retention of students with undergraduate GPAs below 3.00 in online courses. Findings from the needs assessment suggested that students enrolled in online courses at the graduate school found time management for online coursework to be challenging. Students with low undergraduate GPAs and male students had significantly lower self-efficacy for time management in the online learning environment than students with higher GPAs and female students, respectively. A literature review suggested an intervention involving goal setting (Morisano et al., 2010; Schippers et al., 2015) and mental contrasting with implementation intentions (MCII; Kizilcec & Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2017) could be beneficial for improving the time management and associated outcomes such as grades and retention for students taking online courses. Consequently, an intervention containing an initial goal setting activity followed by four rounds of MCII exercises throughout one term was designed for use with online students at the graduate school.

The evaluation of the intervention included both a process evaluation to learn about the implementation of the intervention and an outcome evaluation to learn about the consequences of the intervention for participants. The process evaluation questions were:

1. To what extent did the actual intervention match the intervention as planned?
2. How much of the intervention did participants engage in?
3. How did participants in treated and untreated groups compare in terms of use of non-intervention time management resources and perceptions of job, personal, and school workloads?

And, the outcome evaluation questions were:

1. To what extent were graduate students able to set specific, feasible, and desirable goals; and plan to overcome potential obstacles that might stand in the way of goal achievement?
2. In what ways did the time management intervention influence the time management skills, time management self-efficacy, course completion, and grades of graduate students taking online courses?
3. To what extent did the answers to question two vary for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs?
4. To what extent did the answers to question two vary by gender?

The remainder of this chapter explains the intervention in detail, why these questions were prioritized, and how they were assessed.

The Intervention

Figure 11 shows the intervention's theory of treatment. The intervention had two primary components, the initial goal setting activity and the ongoing MCII activities. The goal setting activity was adapted from other interventions structured to lead students to set specific, feasible, and personally meaningful goals (Morisano et al., 2010; Schippers et al., 2015). Similarly, the ongoing synchronous MCII activities in Figure 11 were adapted from other interventions that led participants to set goals, identify obstacles that may interfere with goal attainment, and plan to overcome them (Kizilcec & Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2017). For MCII activities to be successful, goals should be desirable (Oettingen, 2012) and feasible for participants (Kappes et al., 2012; Kappes et al., 2013), so intervention participants reviewed their initial goal setting exercise before each MCII activity.

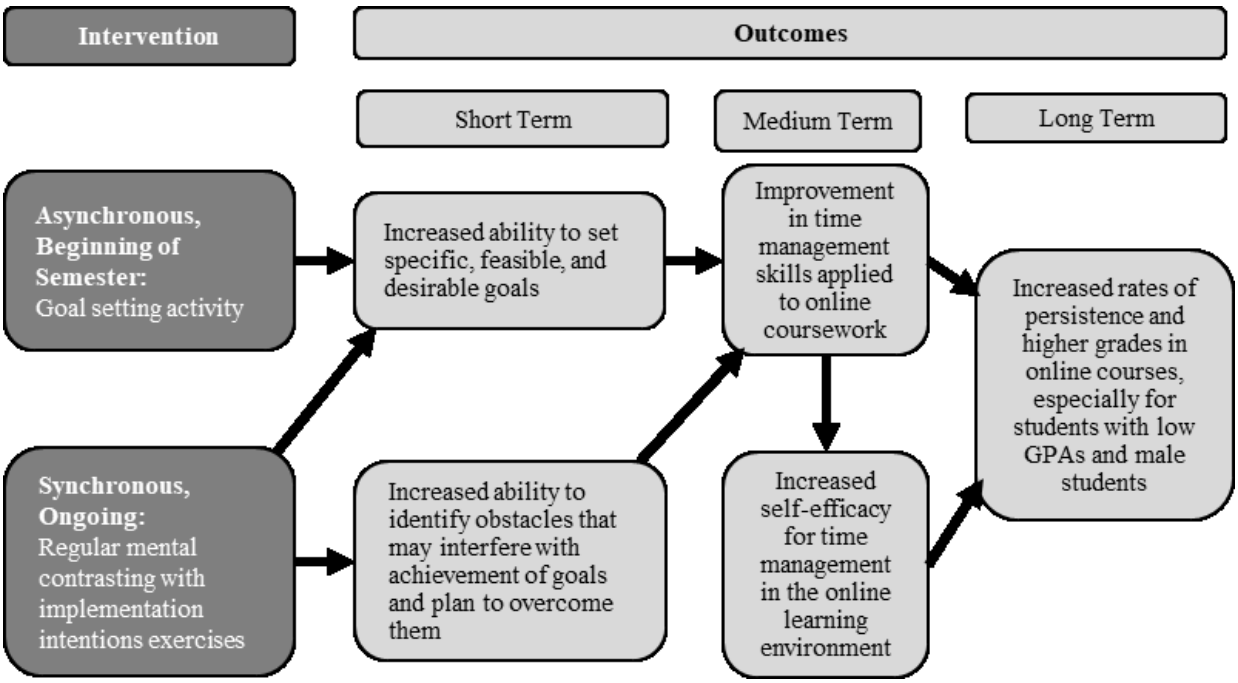

Figure 11. The intervention's theory of treatment.

MCII exercises (i.e., exercises in which participants generate goals, obstacles, and plans to overcome obstacles) have been shown to positively impact time management (Oettingen et al., 2015; Saddawi-Konefka et al., 2017), which, in turn, should positively impact time management self-efficacy (Bandura, 1977). Furthermore, goal setting should also help students manage time in a way that supports goal achievement by focusing attention and effort (Locke & Latham, 2006). Time management skills and self-efficacy should, in turn, influence academic outcomes given that time spent studying positively impacts grades in higher education (Brint & Cantwell, 2010; Stinebrickner & Stinebrickner, 2008) and self-efficacy for online learning relates to grades in online courses (Joo et al., 2013; Wang et al., 2013). A 2015 meta-analysis, Broadbent and Poon identified a significant, although weak, relationship between time management skills and academic achievement in online courses. Similarly, time management strategy use positively related to grades in online and blended courses in a 2017 study conducted by Broadbent.

The connection between the intervention and the long-term outcomes in the theory of treatment is supported by evidence from previous goal setting and MCII interventions. Goal setting interventions have demonstrated a positive impact on academic outcomes and retention, particularly for male students (Schippers et al., 2015) and students with low GPAs (Morisano et al., 2010). Additionally, an MCII activity demonstrated a positive impact on course completion among students from individualist cultures such as the United States in massive open online courses (Kizilcec & Cohen, 2017).

Goal Setting Activity Details

The initial goal setting activity was asynchronous, took about 30 minutes to complete, and was assigned to participants between the first and second classes of the term. The activity was based on portions of previous goal setting interventions that have demonstrated results in terms of student outcomes such as grades and persistence (Morisano et al., 2010; Schippers et al., 2015). During this activity, participants responded to four key writing prompts that asked them to:

- Imagine an ideal future at three different points in time (six months, two years, and five years in the future)
- Imagine a counter-vision to the ideal for each point in time
- Reflect on things they would like to learn, habits they would like to improve, and ways they would like to spend time in the next six months
- Set three to six goals for the next six months (across the domains of school, work, and personal life) and identify strategies for achieving these goals

MCII Details

The four MCII exercises that occurred during the term took approximately 10 minutes each. The exercises were implemented approximately once a month during synchronous class sessions that took place using videoconferencing technology. The MCII exercises were framed using the acronym WOOP, for wish, outcome, obstacle, and plan (Oettingen et al., 2015). When completing a WOOP activity, participants were first prompted to revisit the goals that they set in the initial goal setting activity. Participants were then encouraged to choose a wish in the WOOP activity that related to both their online course and achievement of any of the goals (i.e., in any domain) from the initial goal setting activity. For example, a participant might want to focus on working toward a goal of spending more time with family. A wish related to online coursework related to this goal might be to complete asynchronous coursework while still at their place of employment (e.g., immediately before or after the workday or over lunch during the week) so that they can spend more time on the weekends with family members. Participants were also told that wishes should represent something that is challenging but possible to achieve.

After the facilitator framed the activity, participants worked through a WOOP protocol in which they decided on their wish and imagined associated outcomes, identified an obstacle that might present a barrier to realizing their wish, and came up with a plan to overcome that obstacle when it arose (Oettingen et al., 2015). Instructors running the intervention could choose to facilitate the WOOP protocol either by playing an audio recording of the protocol or verbally talking participants through the protocol themselves. In either case, instructors were prompted to use materials created directly by MCII researchers. WOOP audio is available on the Internet via the website WOOP My Life (Oettingen, 2014). Additionally, the website Character Lab, which includes resources from a network of researchers, has a facilitation playbook for WOOP that

includes a facilitation script (Character Lab, 2019). Thus, instructors could choose to play the audio or read the facilitation script. During the facilitation of the WOOP protocol, participants had time to write a few key words to represent each stage of the WOOP cycle (i.e., wish, outcome, obstacle, and plan) either after the audio is played or during the verbal facilitation of the protocol.

Intervention Support

A logic model, which is similar to a theory of treatment but includes more detail about the inputs (e.g., resources) and contextual factors associated with an intervention (McLaughlin & Jordan, 2010), can help show how contextual factors relate to the intervention and evaluation. A logic model for the time management intervention is included in Appendix D. The main activities for the intervention, as previously described, were the initial goal setting activity and the ongoing MCII exercises. However, two additional activities supported the success of the intervention, facilitator training and an introduction to the intervention for potential participants (i.e., graduate students taking online courses). The introduction to the intervention is described later in the methods section because it involves participant recruitment.

No facilitator training was required for the goal setting activity because it was asynchronous and all materials and prompts were housed in the institution's learning management system. However, instructors who agreed to run the intervention in their classes received training to facilitate WOOP (i.e., MCII) protocols. The training lasted about one hour, and covered facilitation of the WOOP protocol using materials available on the Internet (i.e., Oettingen, 2014; Character Lab, 2019), context-specific elements of the WOOP protocol (e.g., giving participants time to revisit their initial goal setting activity), and data collection procedures (i.e., entering attendance and filling out a questionnaire after facilitating WOOP

activities, and being observed once during the term). Recruitment of faculty facilitators for the intervention is described further in the methods section of this chapter.

Methods

The methods associated with running the time management intervention and completing the associated process and outcome evaluation for the intervention are described in the sections that follow.

Evaluation Design

Both a process and outcome evaluation were conducted for the time management intervention. Process evaluation assesses the extent to which a program or intervention ran as planned, and encompasses engagement of the intended audience, delivery of planned services, and quality of that service delivery (Rossi, Lipsey, & Freeman, 2004). A strong evaluation of an intervention's outcomes depends on a strong process evaluation because process evaluation allows for investigation of the how and why behind whether an intervention worked or not (Rossi et al., 2004; Saunders, Evans, & Joshi, 2005). For example, a finding that outcomes did not change after an intervention could be explained by issues with the implementation of the intervention (e.g., missing components, not reaching intended participants, etc.) or by the failure of the intervention as designed (Saunders et al., 2005). The ongoing process monitoring that occurs as part of process evaluation also allows for changes to be made (e.g., to increase fidelity of implementation) during an intervention's implementation to increase its likelihood of success (Rossi et al., 2004).

Outcome evaluation involves the assessment of the extent to which changes in a program's intended outcomes (e.g., time management skills in the case of this intervention) can be attributed to the intervention itself. Measuring the level of an outcome (e.g., percentage of on-

time assessment submissions) alone after an intervention cannot demonstrate whether the outcome can be attributed to the intervention (Rossi et al., 2004). For example, factors beyond the intervention might influence the measured level of on-time submissions for a given student. If a student's workload associated with their job decreased over the period of the intervention, this could plausibly lead to an increase in on-time submissions not attributable to the intervention. Therefore, outcome evaluations must seek to isolate the impact of the intervention itself, to the extent possible (Leviton & Lipsey, 2007; Rossi et al., 2004).

The evaluation as a whole (i.e., the process and outcome evaluation) followed a convergent parallel mixed methods design in which qualitative and quantitative data relevant to the research questions were collected simultaneously and then integrated during the analysis and interpretation phases (Creswell & Plano-Clark, 2018). The process evaluation included both qualitative (e.g., observation of intervention facilitation) and quantitative (e.g., participant attendance) data collection to assess the delivery of and participant engagement with the intervention as well as contextual factors relevant to the intervention. Both the qualitative and quantitative data from the process evaluation informed the interpretation of the results of the outcome evaluation.

The outcome evaluation included a quasi-experiment. Although randomized control trials are often framed as the ideal experimental design for program evaluations, even randomized control trials do not match the theoretical ideal for experimental design. That is, even a randomized control trial cannot allow for the observation of the same participant under two different conditions at the same time (Henry, 2010). Furthermore, although randomized control trials tend to rely on fewer assumptions than other research designs, they are still subject to sources of bias such as participant selection bias (Torgerson, Torgerson, & Taylor, 2010). In

cases where randomized control trials do not make sense (e.g., are not feasible) for an outcome evaluation, comparison group designs can be strong choices for research design (Henry, 2010). Because the time management intervention was implemented by some instructors and not by others and because students could not be randomly assigned to classes or instructors at the graduate school, a quasi-experimental comparison group design was used.

Although quasi-experimental designs are typically quantitative, the outcome evaluation questions required the collection of qualitative data as well as quantitative data. Therefore, the overall approach to the outcome evaluation, like the approach to the process evaluation, was a mixed methods approach that leveraged the "complementary strengths and nonoverlapping weaknesses" (Johnson & Onwuegbuzie, 2004, p. 18) of qualitative and quantitative approaches. Specifically, a mixed methods intervention design approach, in which qualitative data collection was integrated strategically to strengthen an experiment or quasi-experiment (Creswell and Plano-Clark, 2018), was used. Qualitative data in the form of participant writing from goal setting and MCII activities was analyzed to assess the extent to which the short-term outcomes of the intervention, as shown in Figure 11, were achieved. Qualitative analysis of participant writing, along with mixed (i.e., both qualitative and quantitative) data from the process evaluation then informed the interpretation of quantitative data associated with the medium- and long-term outcomes of the intervention. Therefore, the overall evaluation used a convergent parallel mixed methods design because qualitative and quantitative data were collected throughout the intervention, and analyzed, interpreted, and integrated following the intervention.

Research Questions

The process evaluation of the time management intervention for graduate students in online courses focused on the intervention's two key components shown in Figure 11: the

introductory goal setting activity and ongoing MCII exercises, which were designed to be the primary drivers of the desired outcomes of the intervention. However, the process evaluation also measured contextual factors (e.g., participants' use of time management resources that were not part of the intervention) that may have related to the outcomes shown in Figure 11.

The following three questions were investigated as part of the process evaluation:

1. To what extent did the actual intervention match the intervention as planned?
2. How much of the intervention did participants engage in?
3. How did participants in treated and untreated groups compare in terms of use of non-intervention time management resources and perceptions of job, personal, and school workloads?

The first two questions assess the intervention's two key components (i.e., the initial goal setting activity and the ongoing MCII exercises). The third question assesses potential variables that could confound the interpretation of outcome measures. For example, if a participant began using a calendar resource during the period of the intervention, their time management self-efficacy might have increased for reasons unrelated to the intervention.

Given the quasi-experimental comparison group design used in the outcome evaluation, students in classes receiving the treatment (i.e., time management intervention) were compared to students in classes not receiving the treatment on the measured medium- and long-term outcomes shown in Figure 11. The research questions associated with the outcome evaluation were:

1. To what extent were graduate students able to set specific, feasible, and desirable goals; and plan to overcome potential obstacles that might stand in the way of goal achievement?

2. In what ways did the time management intervention influence the time management skills, time management self-efficacy, course completion, and grades of graduate students taking online courses?
3. To what extent did the answers to question two vary for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs?
4. To what extent did the answers to question two vary by gender?

The first question does not involve a comparison between treated and untreated groups because it relates to the intervention's proximal outcomes, meaning those participants in the intervention "take with them out the door as they leave" (Rossi et al., 2004, p. 209). Figure 11 shows these outcomes as the short-term outcomes designed to influence the medium- and long-term outcomes targeted by the intervention. Questions two through four therefore build on question one and involve comparison between treated and untreated groups on medium- and long-term outcomes, consistent with a quasi-experimental design (Shadish, Cook, & Campbell, 2002).

Questions three and four also allow for the assessment of the intervention's outcomes for students with low undergraduate GPAs and male students. These questions relate directly back to the problem of practice established in Chapter 1 and the results of the needs assessment summarized in Chapter 2. The problem of practice suggests that students with low GPAs tend to earn lower grades in online courses than in face-to-face courses (Figlio et al., 2013; Xu & Jaggars, 2014) and complete online courses at lower rates than students with higher GPAs (Cochran et al., 2014; Xu & Jaggars, 2014). Results of the needs assessment suggested that although time management may be an area of struggle across all students enrolled in online courses at the graduate school, students with undergraduate GPAs below 3.00 had significantly lower time management self-efficacy for online learning than students with higher GPAs, as did

male students when compared to female students. Therefore, the outcomes targeted by the time management intervention were particularly important for students with low GPAs and male students.

Participants

Participant recruitment and selection occurred in two phases. First, faculty members teaching online courses at the graduate school were recruited to run the intervention in their classes or have their classes designated to not receive the intervention (i.e., be an untreated group). Next, graduate students in classes taught by recruited faculty members were recruited to participate. Protocols to generate participation while avoiding coercion were used to recruit faculty and graduate students for the study. Faculty and graduate student recruitment and selection, all of which took place in the fall term of 2019, are described in the sections that follow.

Faculty recruitment. The practitioner researcher running the study is the dean of online instruction at the graduate school, and therefore had some positional authority relative to faculty members who were asked to consider running the intervention or having their classes designated as part of the untreated group. As such, protocols to avoid coercion in faculty recruitment were particularly important. To recruit faculty members, the practitioner researcher sent an introductory email explaining the purpose of the study and different participation options (i.e., volunteering to run the intervention, volunteering to have a class designated an untreated group, and not participating). The initial email, shown in Appendix E, was followed by a short presentation at a faculty meeting that included time for faculty members to ask questions. In both the initial email and faculty presentation, the goals of the intervention were made clear, as were all time commitments associated with participation, so that faculty could consider the benefits

and drawbacks of participation. After the presentation, two follow-up emails, also included in Appendix E, were sent to faculty.

Across all stages of faculty recruitment (i.e., initial email, presentation, and follow-up emails) the optional nature of participation was emphasized. Explicit language was included in each email and in the presentation to let faculty know that their choice of whether or not to participate in the study had no bearing on job evaluations, pay, or future opportunities at the graduate school. Furthermore, faculty members were not offered incentives to participate, and like student participants, could withdraw from the study at any time, which was also made clear throughout the recruitment process.

Graduate student recruitment. Graduate students were the target audience for the intervention. Those in both treated and untreated online classes received an email, included in Appendix F, explaining the nature of the study and participation prior to their first synchronous class of the term. During their first synchronous session, graduate students received a brief overview of the intervention via a recorded video presentation by the practitioner researcher. Graduate students were invited to ask any questions by emailing the practitioner research directly and received a follow-up email after the presentation, which is also included in Appendix F. As with faculty recruitment messages, every graduate student recruitment message contained clear language stating that participation was voluntary, that there were no repercussions associated with not participating, and that if graduate students chose to participate they could withdraw at any time. Like faculty members, graduate students were not offered incentives for participation. No graduate students taught directly by the practitioner researcher were included in the study to avoid the potential for coercion. Finally, both graduate students and faculty members were given

the name and contact information of an employee of the institution who had no direct authority over them to contact if they wanted to withdraw.

Participant selection. The classes taught by all faculty members who volunteered to participate (i.e., by either running the intervention or having their class designated as an untreated group) were included in the study. Similarly, all students who agreed to participate in each of those classes were included in the study. Although this approach likely introduced some bias into the study (e.g., participant characteristics may vary between treated and untreated groups because participants were not randomly assigned), random participant assignment to a treated or untreated group was not feasible because participants were either in a class taught by a faculty member running the intervention or a class taught by a faculty member who had agreed not to run the intervention. Additionally, this approach maximized potential sample size, which can allow for the use of quantitative data analysis techniques that can be used to minimize bias (e.g., regression with the inclusion of covariates; Henry, 2010) during the quantitative analysis of results.

Consent forms and data collection. Faculty who agreed to run the intervention were considered participants because they were asked to complete brief questionnaires regarding their implementation of MCII exercises throughout the term. All students who agreed to participate in both classes receiving the treatment (i.e., the intervention) and not receiving the treatment were also considered participants. Potential participants in each of these groups (i.e., faculty facilitators, participants in the treated group, and participants in the untreated group) received a separate version of the consent form. As with the recruitment materials, all consent forms emphasized the optional nature of participation and the option to withdraw at any time. Only

faculty who volunteered to run the intervention and signed the consent form were asked to run the intervention.

All students in any class section taught by a faculty member running the intervention or who volunteered to have their class designated not to receive the treatment engaged in the exact same class activities throughout the term. This means that for students in classes taught by faculty members implementing the intervention, students who agreed to participate in the study and students who did not agree to participate both completed intervention activities (i.e., goal setting and MCII exercises) as part of the class. However, no data were collected on students who did not sign the consent form indicating their agreement to participate in the study. Similarly, for students in classes designated as untreated groups, data were collected on students who agreed to participate by signing the consent form and were not collected on any other students. Finally, students in both the treated or untreated groups who chose not to participate were not asked to complete pre- or post-intervention questionnaires.

Measures

Given the convergent parallel mixed methods design for the evaluation of the intervention, both qualitative and quantitative data were collected during the process and outcome evaluation components of the overall evaluation. The following sections describe the measures and instrumentation used as part of both types of evaluation (i.e., process and outcome) for the time management intervention.

Process evaluation measures. The process evaluation included measures of the five dimensions of fidelity of implementation as defined by Dusenbury, Brannigan, Falco, and Hansen (2003): adherence, quality of delivery, dose, participant responsiveness, and program differentiation. Adherence and quality of delivery both relate to the way the intervention is

delivered or facilitated. Adherence refers to the correspondence between the elements of the intervention that were planned and the elements of the intervention that were delivered. Quality of delivery goes beyond simple delivery or lack thereof and refers to the extent to which the way the intervention is delivered matches the intervention's theory of treatment (Dusenbury, Brannigan, Falco, & Hansen, 2003). For example, MCII exercises were one element of the time management intervention. Faculty failure to implement the MCII exercise approximately once monthly as planned is an example of an adherence issue. Lack of sufficiently clear directions during an MCII exercise (e.g., that implied participants should pick any wish rather than one specifically related to online coursework), on the other hand, is an example of an issue with quality of delivery.

Whereas adherence and quality of delivery relate primarily to researcher and facilitator actions, dose and participant responsiveness focus on participants, though they may also be influenced by researcher or facilitator actions. Dose refers to the amount of an intervention a participant actually receives, and participant responsiveness refers to participants' perceptions of and engagement with the intervention (Dusenbury et al., 2003). For example, in the context of the time management intervention, a participant could have attended all classes that included an MCII exercise (i.e., received an ideal dose), but become distracted during the exercise and failed to complete the writing prompts associated with it (i.e., demonstrated less than ideal participant responsiveness).

The last component of fidelity of implementation as defined by Dusenbury et al. (2003) is program differentiation, which refers to the ability of a process evaluation to distinguish between different elements of a given program. In the case of the time management intervention, understanding program differentiation requires a clear delineation between the initial goal setting

activity and the MCII activities. As such, each measure of adherence, quality of implementation, dose, and participant responsiveness, as described in the sections that follow, corresponds either to the initial goal setting activity or to the MCII experiences. Finally, in addition to measures of Dusenbury et al.'s five dimensions of fidelity, the process evaluation also includes measures of relevant contextual factors (i.e., factors that are not part of the intervention but that may have influenced the measured outcomes of the program; Baranowski & Stables, 2000). The following sections describe each measure, grouped according to process evaluation research questions.

Measures associated with process evaluation question one. Measures of adherence and quality of delivery were used to answer the first process evaluation research question: to what extent did the actual intervention match the intervention as planned? To answer this question, data were collected to measure the adherence and the quality of delivery of the MCII exercises. Although both the MCII exercises and the initial goal setting exercise were key elements of the intervention based on their proposed connection to the intervention's desired outcomes shown in Figure 11, only the MCII activities required facilitation. The goal setting activity was asynchronous and so was not assessed for this research question because the information was presented exactly as designed. That is, adherence and quality of delivery were assumed with the goal setting activity, but there was more room for variation and error with the MCII exercises. Two indicators, adherence self-reports from facilitators and an observational checklist and descriptive report completed by the practitioner researcher were used to assess adherence and quality of delivery respectively.

Adherence self-report. Faculty members implementing MCII exercises were asked to complete a questionnaire, shown in Appendix G, once after each MCII exercise for a total of four times across the term. The questionnaire included closed-ended items asking faculty members to

report whether they included each component of the MCII exercise that they facilitated. The questionnaire also included two open-ended items asking faculty members to provide an explanation for any components of the exercise not implemented and describe how their implementation of the exercise changed from their previous implementation, if applicable. The questionnaire was created by the practitioner researcher and reviewed by a research methods faculty member.

Checklist and descriptive report. Facilitator self-reports provide useful information about the implementation of intervention components but may be more prone to error than other measures, including observation (Dusenbury et al., 2003). Therefore, a checklist and descriptive report, which is included in Appendix H, was used during observations of six different instructors facilitating MCII exercises. The initial plan was to observe each of the 11 instructors facilitating an MCII exercise one time. However, the teaching schedule of the practitioner researcher, who was the observer, prohibited observation of every facilitator. The checklist aspect of the observation report included the same intervention elements (i.e., the key elements of the MCII exercises) that facilitators were asked about in the adherence self-report. Despite the fact that not all instructors were observed facilitating the intervention, this allowed for triangulation of adherence data, which increases the credibility of the findings (Johnson et al., 2007). The descriptive portion of the observation report focused on the quality of delivery.

Quality of delivery should assess the implementation of an intervention relative to a theoretical ideal (Dusenbury et al., 2003). The MCII exercise, referred to as WOOP (wish, outcome, obstacle, plan; Oettingen et al., 2015) in implementation, may be most effective when participants choose goals that are specific and desirable (Oettingen, 2012), and that they expect to achieve (Kappes et al., 2012; Kappes et al., 2013). Also, MCII may only work when identified

obstacles are within a participant's control (Kizilcec & Cohen, 2017). Consequently, quality of delivery for the MCII exercises is defined as facilitation that supports participant identification of specific, desirable, and feasible goals as well as obstacles that are within their locus of control. The descriptive reports associated with facilitator observations of MCII were therefore qualitatively analyzed and compared to this definition of quality of delivery for the MCII exercises.

Measures associated with process evaluation question two. Data collected to answer process evaluation question two (i.e., how much of the intervention did participants engage in?) included indicators of dose and participant responsiveness. Whereas the indicators of adherence and quality of delivery only related to the MCII activities, indicators of dose and participant responsiveness were included for both the goal setting activity and the MCII activities because both involved participant actions. Consequently, neither dose nor participant responsiveness could be assumed for these two critical components of the intervention.

Completion of goal setting activity components. Completion of the components of the goal setting activity was included in the process evaluation as an indicator of dose. The goal setting activity included four writing prompts. Completion of each prompt was assessed once as a binary variable (i.e., yes or no) using course data available in the institution's learning management system. The ideal dose for participants was completion of all components of the goal setting activity. However, achieving an ideal is rarely realistic, so dose was measured against the more feasible goal of mean participant completion of at least three out of four writing prompts in the goal setting activity.

Perception of engagement. To complement the dose data (i.e., completion of writing prompts), data on an additional indicator related to participant responsiveness to the goal setting

activity were collected. Self-report can be used to assess participant responsiveness (Dusenbury et al., 2003), so items associated with participant perception of the goal setting activity were included in the post-intervention questionnaire for participants in class sections that received the intervention. The questionnaire, which also included additional items related to different elements of the process evaluation, can be found in full in Appendix I. Three items from the questionnaire related to participant perception of engagement with the goal setting activity, specifically. First, participants responded to a quantitative item asking them to rate the extent to which they felt fully engaged in the goal setting activity using a six-point scale ranging from strongly disagree to strongly agree. Second, participants responded to two open-ended items asking them to identify the aspects of the goal setting and WOOP activities they found the most and least useful.

Presence in class during MCII exercises. Presence during each MCII exercise was also a measure of dose. As with the goal setting activity, the ideal dose for MCII exercises was a complete dose, meaning attendance at all class sessions in which MCII activities were facilitated. However, as with the goal setting activity, dose associated with the MCII activities was measured against a more realistic benchmark, in this case mean participant attendance of at least three out of the four classes during which MCII exercises were implemented. For this indicator, attendance information was retrieved from the institution's learning management system.

Perception of MCII exercises. Similar to the approach of collecting data about the goal setting activity, data on participant responsiveness to MCII exercises were collected to complement the dose data described in the previous section. Participants who were in a class section that received the intervention responded to post-intervention questionnaire items similar to those used to assess participant responsiveness to the goal setting activity. First, participants

responded to two quantitative items asking them to rate the extent of their engagement with the MCII activities and the extent to which revisiting the goal setting activity at the beginning of each MCII activity was useful. Next, participants responded to two qualitative items asking them to describe the most and least useful aspects of the goal setting and MCII activities. Exact items can be found in Appendix I.

Measures associated with process evaluation question three. The third process evaluation question (i.e., how did participants in treated and untreated groups compare in terms of use of non-intervention time management resources and perceptions of job, personal, and school workloads?) is associated with indicators of context. The logic model for the time management intervention (see Appendix D) identifies relevant contextual factors including participant job, school, and personal responsibilities; and participant access to time management resources not included in the intervention. These contextual factors are relevant because of their potential relationship to intervention outcomes. For example, students have identified family and employment responsibilities as barriers to success in online courses (Brown et al., 2015; Phirangee & Malec, 2017). Participants who perceived that they spent more time than others on job or personal responsibilities may have found it more difficult to manage time in online courses. Similarly, variation among participants' perceived school responsibilities (i.e., work required per course or number of courses taken in a semester) might relate to variance in time management skills or self-efficacy. Therefore, participant perception of workload associated with job, school, and personal responsibilities was assessed as part of the process evaluation.

To determine the impact of any program, it is important to rule out plausible alternative explanations for observed outcomes (Leviton & Lipsey, 2007). Participant use of time management resources beyond those in the intervention is thus an important contextual factor to

consider because nonintervention time management resources could influence time management skills or time management self-efficacy. Consequently, participant use of nonintervention time management resources was assessed via questionnaire along with items measuring workload perceptions. The questionnaire, which is included in Appendix I, includes open- and closed-ended items, allowing for the collection of both qualitative and quantitative data. No specific goals for the measures of contextual factors were set because it was beyond the scope of the intervention to influence things like perceptions of job responsibilities. However, the data collected related to context was used in the outcome evaluation to strengthen inferences about the relationship between the intervention and its intended outcomes.

As with the items on the faculty questionnaire that were used to measure adherence, some items on the post-intervention questionnaire for participants were written by the practitioner researcher and were reviewed by a research methods faculty member. Appendix I also includes two items on the post-intervention questionnaire that were not developed by the practitioner researcher. These items have been included on the graduate school's institutional survey for students across multiple previous administrations of this survey and were developed by research faculty at the graduate school.

Outcome evaluation measures. Each outcome shown in the theory of treatment (i.e., Figure 11, included again for reference following this paragraph) was measured as part of the outcome evaluation. First, the intervention's short-term outcomes were measured qualitatively. Specifically, student writing was qualitatively analyzed because this approach fits with the assessment of outcomes such as an increased ability to set goals that are specific, feasible, and desirable. The medium- and long-term outcomes were measured quantitatively.

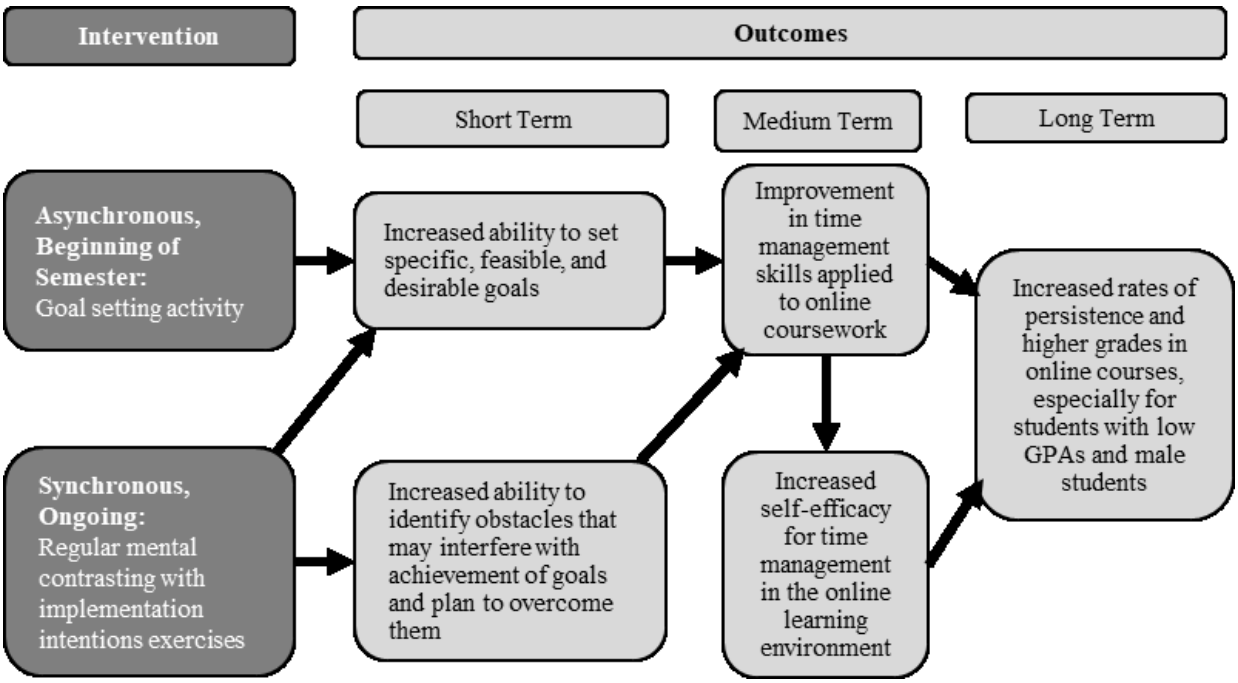

Figure 11. The intervention's theory of treatment.

Short-term outcomes. The desired short-term outcomes of the intervention, as shown in Figure 11, were increases in participant ability to set specific, feasible, and desirable goals; and increases in ability to identify obstacles that may interfere with the achievement of goals and plan to overcome them. These outcomes were assessed to answer the first research question of the outcome evaluation: to what extent were graduate students able to set specific, feasible, and desirable goals; and plan to overcome potential obstacles that might stand in the way of goal achievement? Participant writing from the goal setting activity and MCII exercises were qualitatively analyzed to answer this question with specific attention to three constructs of interest: goal quality, actionable obstacle, and plan alignment. Whether or not the obstacle is actionable as well as goal quality can both be explored based on participant writing alone. An actionable obstacle refers to one that a participant can control. Identifying an actionable obstacle is important because MCII may be ineffective if participants identify obstacles that they cannot

do anything about (Kizilcec & Cohen, 2017). For example, watching television on weekend afternoons, getting sick, and experiencing a power outage are all potential obstacles to spending time on schoolwork as planned. However, an individual has a high degree of control over their television watching as compared to experiencing an illness or power outage.

Plan alignment refers to the extent to which the plan an individual comes up with as part of an MCII exercise relates to the obstacle they identified that may prevent them from achieving their goal. For example, if an individual's goal is to complete a specific assignment on an upcoming Saturday, and they have identified a weekend television-watching habit as a potential obstacle to that goal, an aligned plan might be: When I find myself wanting to take a break from my assignment to watch television, then I will take a five-minute break and walk around the block before returning to my assignment instead of watching television. A misaligned plan might be: When I find myself wanting to take a break from my assignment to watch television, then I will work on preparing dinner while I watch television.

Goal quality refers to the extent to which the goals set by participants in the initial goal setting activity as well as in MCII exercises were specific, feasible, and desirable. Because the desirability of a goal likely cannot be determined from participant writing (e.g., a participant could write a goal that seems desirable to the researcher but that does not represent something the participant cares about achieving), a question about the construct of goal desirability was included in post-intervention questionnaire (see question 2 in Appendix I). Finally, because the desired short-term outcomes constituted increases in certain skills, all student writing collected to measure short-term outcomes were saved relative to the initial goal setting activity or the MCII round in which they were completed. This allowed for the consideration of change over time in the analysis phase.

Medium-term outcomes. The medium-term outcomes shown in the theory of treatment (see Figure 11) included increases in time management skills and time management self-efficacy for participants. Measures of medium-term outcomes were used to answer portions of the following outcome evaluation questions:

2. In what ways did the time management intervention influence the time management skills, time management self-efficacy, course completion, and grades of graduate students taking online courses?
3. To what extent did the answers to question two vary for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs?
4. To what extent did the answers to question two vary by gender?

Specifically, the elements of questions two, three, and four above that relate to time management skills and time management self-efficacy are related to medium-term outcomes, whereas the elements related to course completion and grades are related to long-term outcomes.

Time management skills. A measure of on-time completion of assessments was used as a proxy variable for time management skills. Timing and rate of task submissions have been used as outcome variables in studies of other interventions related to self-regulated learning in higher education (e.g., Anderberg et al., 2018; Baker et al., 2016; Baker et al., 2018; Seo et al., 2018). Self-report of time spent on specific tasks (e.g., studying) has also been used as an outcome variable in multiple studies of interventions targeting self-regulated learning in higher education (e.g., Häfner, Oberst, & Stock, 2014; Oreopoulos et al., 2018; Saddawi-Konefka et al., 2015). However, self-report of time spent requires more work from participants and is subject to recall errors. On-time completion of assessments, in contrast, was recorded in the learning management system for each course. On-time completion of assessments also theoretically relates to time

management because time management involves the actions taken by a person when structuring and using time (Aeon & Aguinis, 2017). If an individual structured and used time well in relation to an online course, it stands to reason that their on-time completion rate for course assessments would be higher than it would be for a person who did not structure and use time well for the online course. As such, the percent of course assessments submitted on time was measured for each participant.

Time management self-efficacy. Time management self-efficacy was measured using the same scale that was used in the needs assessment: the time management subscale of Zimmerman and Kulikowich's (2016) online learning self-efficacy scale. As described in Chapter 2, small edits to this scale were made because of cognitive interviews to enhance its validity in the context of the graduate school, specifically. Table A2 in Appendix A includes all original and revised items in the online learning self-efficacy scale, along with rationale for revisions made. Only one item on the time management subscale was revised, and the revised subscale had strong internal consistency when used in the needs assessment (i.e., Cronbach's alpha of .91.), suggesting that the subscale was reliable for use in the context of the intervention. The scale was administered before the intervention began to participants in both treated and untreated class sections, and again after the intervention, as part of the post-intervention questionnaire for both groups.

Long-term outcomes. Course grades and completion are the long-term outcomes included in the theory of treatment, as shown in Figure 11. Like the medium-term outcomes, measurements of the long-term outcomes relate to the following outcome evaluation questions:

2. In what ways did the time management intervention influence the time management skills, time management self-efficacy, course completion, and grades of graduate students taking online courses?
3. To what extent did the answers to question two vary for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs?
4. To what extent did the answers to question two vary by gender?

Whereas medium-term outcomes were associated with the time management skills and time management self-efficacy components of these questions, long-term outcomes were associated with the course completion and course grades components of these questions. Course completion is defined as having passed the course with a final grade of 70% or higher. Students receiving a final grade lower than 70% or receiving an incomplete or a withdrawal on their transcript rather than a grade were defined as not having completed the course successfully. Data from the institution's learning management system were used to assess every participant on course completion; the variable was measured as either a yes or a no. If a participant was enrolled in more than one online course in the term, they received a yes if they completed every online course and a no if they did not complete one or more courses. Course grade was determined using the same data as course completion. However, students receiving incompletes and withdrawals on their transcripts were excluded from analysis of course grades, and course grade was measured on an interval scale (i.e., score out of 100 for the course) rather than as a categorical variable like course completion. If a participant was enrolled in more than one online course for the term, course grade was calculated as a weighted average based on the number of credits allocated to each course.

Procedure

Table 6 shows a timeline of the major actions related the implementation of the intervention and collection of process and outcome evaluation data. Much of the process evaluation data were collected as the intervention ran, which allowed for adjustments to be made to the support provided for the intervention. For example, the practitioner researcher provided implementation tips to intervention facilitators before each MCII cycle, which were based on observations from the previous cycle.

Table 6

Key Intervention and Data Collection Actions by Month

Month	Intervention	Process Evaluation Data Collection	Outcome Evaluation Data Collection
August, 2019	• Faculty recruitment • Faculty training (~60 mins)	• N/A	• N/A
September, 2019	• Student participant recruitment • Participants completed initial self-paced goal setting activity (~30 mins) • Participants engaged in one MCII exercise during a synchronous class (~10 mins)	• Practitioner researcher observed two faculty facilitators • Data collection related to participant writing for the goal setting activity (i.e., completion of each prompt and actual written responses) • Faculty facilitators took attendance and filled out a questionnaire (Appendix G) after implementing an MCII exercise	• Participants completed pre-intervention questionnaire • Practitioner researcher checked the status of participant writing for MCII exercises at the end of the month
October, 2019	• Participants engaged in one MCII exercise during a synchronous class (~10 mins)	• Practitioner researcher observed two faculty facilitators • Faculty facilitators took attendance and filled out a questionnaire (Appendix G) after implementing an MCII exercise	• Practitioner researcher checked the status of participant writing for MCII exercises at the end of the month

Month	Intervention	Process Evaluation Data Collection	Outcome Evaluation Data Collection
November, 2019	• Participants engaged in one MCII exercise during a synchronous class (~10 mins)	• Faculty facilitators took attendance and filled out a questionnaire (Appendix G) after implementing an MCII exercise	• Practitioner researcher checked the status of participant writing for MCII exercises at the end of the month
December, 2019	• Participants engaged in one MCII exercise during a synchronous class (~10 mins)	• Faculty facilitators took attendance and filled out a questionnaire (Appendix G) after implementing an MCII exercise • Term-long data collected from: o Attendance logs o Faculty questionnaires	
January, 2020	• N/A	• Post-intervention questionnaire sent to participants	• Post-intervention questionnaire sent to participants • Collection of the following data from the learning management system for participants: o % of assessments completed on time in online course(s) o final grade in online course(s) • Collection of data from student information system and rosters

Note. Instructors facilitated MCII exercises approximately once a month, on a schedule of their choosing. In some cases, this meant that instructors facilitated at the beginning and end of one month (e.g., October) instead of exactly once a month.

Summary Matrices and Data Analysis

Tables 7 and 8 are summary matrices for the intervention's process and outcome evaluations, respectively. All components of the matrices have been described in previous sections of this chapter except for the last column in each table, the data analysis column. This

column outlines the data analysis techniques associated with each data source, and these techniques are further explained after the summary matrices.

Table 7

Process Evaluation Summary Matrix

Process Evaluation Question	Process Evaluation Indicator	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
1. To what extent did the actual intervention match the intervention as planned?	Extent of adherence to MCII protocol	Faculty	Questionnaire (see Appendix G)	Four times in the term (once after each MCII exercise)	Descriptive statistics; inductive thematic analysis
	Faculty implementation of MCII exercises	Observer	Observation checklist & report (see Appendix H)	One observation of six faculty members who implemented the intervention	Descriptive statistics; deductive thematic analysis
2. How much of the intervention did participants engage in?	Completion status of components of goal setting activity	Graduate students	Gradebook in learning management system	Once at the begging of the term	Descriptive statistics
	Perceptions of engagement with goal setting activity	Graduate students	Questionnaire (see Appendix I, items 4, 5, and 6)	Once at the end of the term	Descriptive statistics for closed-ended items; inductive thematic analysis for open-ended item
	Presence in class during MCII exercises	Faculty	Attendance log in learning management system	Four times a term (once after each MCII exercise)	Descriptive statistics

Process Evaluation Question	Process Evaluation Indicator	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
	Perceptions of engagement with MCII exercises	Graduate students	Questionnaire (see Appendix I, items 1, 3, 5, and 6)	Once at the end of the term	Descriptive statistics for closed-ended items; inductive thematic analysis for open-ended item
3. How did participants it treated and untreated groups compare in terms of use of non-intervention time management resources and perceptions of job, personal, and school workloads?	Perceptions of workload responsibilities	Graduate students	Questionnaire (see Appendix I, items 10, 11, and 12)	Once at the end of the term	Descriptive statistics
	Use of non-intervention time management resources	Graduate students	Questionnaire (see Appendix I, items 7, 8, and 9)	Once at the end of the term	Descriptive statistics for closed-ended items; inductive thematic analysis for open-ended item

Table 8

Outcome Evaluation Summary Matrix

Outcome Evaluation Question	Construct(s)	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
1. To what extent were graduate students able to set specific, feasible, and desirable goals; and plan to overcome potential obstacles that might stand in the way of goal achievement?	Goal quality	Graduate students	Goal setting activity in learning management system	Once at the begging of the term	Deductive thematic analysis
			Digital MCII worksheet	Four times a term (once after each MCII exercise)	Deductive thematic analysis

Outcome Evaluation Question	Construct(s)	Data Source(s)	Data Collection Tool	Frequency	Data Analysis
	Actionable obstacle Plan alignment	Graduate students	Digital MCII worksheet	Four times a term (once after each MCII exercise)	Deductive thematic analysis
	Desirable goal	Graduate students	Questionnaire (see Appendix I, item 2)	Once at the end of the term	Descriptive statistics
2. In what ways did the time management intervention influence the time management skills, time management self-efficacy, course completion, and grades of graduate students taking online courses?	Time management skills	Graduate students	Assessment submission data (i.e., submitted on time or not) from learning management system	Once at the end of the term	Descriptive statistics; difference in means tests; multiple regression
	Time management self-efficacy	Graduate students	Questionnaire: time management subscale of the online learning self-efficacy scale (Zimmerman & Kulikowich, 2016; see Appendix A)	Twice; once at the beginning and once at the end of the term	Descriptive statistics; difference in means tests; multiple regression
	Course completion	Graduate students	Gradebook in learning management system	Once at the end of the term	Descriptive statistics; Fisher's exact test for association
	Grades	Graduate students	Gradebook in learning management system	Once at the end of the term	Descriptive statistics; difference in means tests; multiple regression

Although Table 8 does not include the third and fourth outcome evaluation questions, answers to these questions, which are included below, are based on answers to the second outcome evaluation question:

3. To what extent did the answers to question two vary for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs?
4. To what extent did the answers to question two vary by gender?

Table 8 includes the data collection and analysis techniques that were used for questions two through four, all grouped with question two. Data on student gender and undergraduate GPA were retrieved from the institution's student information system.

Data analysis techniques. Before final data analysis took place, data from different sources were combined and anonymized. Participants were assigned a random number between one and 500 to serve as a unique participant identifier. All personally identifiable information (e.g., participant names, email addresses, or student ID numbers) were removed from files after all data were collected and replaced with the randomly assigned participant identifier number. One spreadsheet with participant names and randomly assigned participant identifier numbers was kept until this process was complete, at which point this spreadsheet was destroyed.

Quantitative data analysis. Descriptive statistics were used to analyze all quantitative data associated with the process evaluation because the process evaluation questions focus on the measured levels of different indicators (e.g., attendance). In contrast, quantitative analysis of outcome data involved both descriptive statistics and inferential statistics. Descriptive statistics were used to provide an overview of measured outcomes for the treated and untreated groups. Next, multiple regression was used for the second outcome evaluation question with regards to time management skills as measured by on-time completion of assessments, time management self-efficacy, and course grades. Multiple regression was not used for course completion because course completion is a categorical variable. All regression models included covariates (e.g., measurements from the process evaluation and participant demographic characteristics) to

minimize bias associated with the quasi-experimental design (Henry, 2010). However, not all multiple regression models included all possible covariates, as described next as well as in chapter five.

The following general format for a multiple regression equation was used for an initial model for each of the dependent variables of interest (i.e., time management self-efficacy, percent of assessments submitted on time, and grades):

$$\hat{y} = b_0 + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 \ldots b_nx_n \quad (1)$$

In Equation 1, $\hat{y}$ represents the estimated value of the dependent variable of interest and b_0 represents the y-intercept of the equation. x_1 is a dummy variable for participation in the intervention. Participants who received the intervention were coded one and participants who did not were coded zero. b_1 is the coefficient associated with participation in the intervention. x_2 represents the pretest measure of self-efficacy, and b_2 is the coefficient associated with this pretest measure in the regression model. x_3 and x_4 are dummy variables representing undergraduate GPA and gender respectively. An undergraduate GPA below 3.00 and gender of male were coded one and undergraduate GPA at or above 3.00 and gender of female were coded zero. b_3 and b_4 are therefore the coefficients associated with an undergraduate GPA below 3.00 and a gender of male, respectively. Last, x_5 to x_n and b_5 to bn represent additional covariates that were considered for use in multiple regression models.

Participation in the intervention was included in every multiple regression model because it is the variable of interest in research question two. Inclusion of pre-intervention self-efficacy was prioritized in initial regression models because it allows regression models to reflect a value-added approach (Henry, 2010), controlling for differences in incoming time management self-efficacy among participants. Undergraduate GPA and gender were also prioritized as covariates

for inclusion in initial multiple regression models because of their relevance to the problem of practice and findings of the needs assessment. As was the case in the needs assessment, gender was treated as a binary variable, which does not capture a range of gender identities beyond male and female (Richards et al., 2016). However, because students identifying as male may be at risk of more negative outcomes and experiences in online courses compared to students identifying as female (Cochran et al., 2014; Figlio et al., 2013; Kuo & Belland, 2016; Rovai, 2002; Xu & Jaggars, 2014), and because 155 out of 156 participants in the study identified as either male or female, gender was left as a binary variable. However, future research on online education would benefit from a non-binary approach to gender identity.

Table 9 shows the additional possible covariates that were considered for inclusion in the multiple regression models along with rationale for their potential inclusion. After data were collected, the initial multiple regression models for each dependent variable of interest (i.e., on-time assessment completion, time management self-efficacy, and course grade) included all independent variables in table nine except for campus and instructor. Campus and instructor were not included in any multiple regression models, because they would have required the inclusion of 19 and 15 separate dummy variables respectively.

Table 9

Variables Considered for Inclusion as Additional Covariates in Regression Models

Variable	Explanation	Rationale for Potential Inclusion
Use of time management resources other than those in the intervention	Dummy variable; 1 for yes and 0 for no	Use of resources beyond the activities included in the intervention may influence time management skills and time management self-efficacy.
Composite of participant perception of workload associated with job, personal, and school responsibilities	Mean of response to three items asking about perceptions of workload associated with job, personal, and school responsibilities respectively; each item includes a 1 to 6 response scale where 1 represents strongly disagree and 6 represents strongly agree	High perception of workload could plausibly relate to lower time management skills and time management self-efficacy.
Year in graduate school	Dummy variable; 1 for student in year 1 of the program and 0 for student in year 2 of the program	All participants were in either year 1 or year 2 of graduate school; those in year 2 may have higher time management skills and time management self-efficacy as applied to graduate coursework compared to students in year 1 based on their prior experience.
Instructor	Series of dummy variables; exact number dependent on number of instructors who participate	Instructors likely influence outcomes of interest to some extent. For example, an instructor who more clearly communicates deadlines may have a higher percentage of students submit assessments on time.
Campus	Series of dummy variables; exact number dependent on number of campuses considered to be the home campus of participants	Participants may have been enrolled at the graduate school's fully online campus, but may also have been primarily enrolled at a physical campus in a specific geographic location. Institutional data collection indicates that a variety of measures associated with student achievement and satisfaction vary by campus, so the variable is worth checking in this study as well.
Race/ethnicity	Dummy variable; 1 for student who identifies as from a racial or ethnic group historically	Students who have racial or ethnic identities that are historically underrepresented in higher education may

Variable	Explanation	Rationale for Potential Inclusion
	underrepresented at institutions of higher education and 0 for all other students	be disadvantaged in online courses as compared to face-to-face courses (e.g., Hispanic, Black, or Latino students; Figlio et al., 2013; Kaupp, 2012; Xu & Jaggars, 2014)
Age	Interval variable determined based on participant birthdate	Younger students may have lower self-efficacy in online courses (Castillo-Merino & Serradell-López, 2014), higher perceptions of transactional distance in online courses (e.g., feel more isolated; Huang et al. 2016), and perform worse in online as compared to face-to-face courses (Xu & Jaggars, 2014) as compared to older students

Note. For the race/ethnicity variable, students identifying as American Indian or Alaska Native; Black or African American; Latinx; and/or Native Hawaiian or Other Pacific Islander were included in the group defined as historically underrepresented. As with gender, this binary variable vastly oversimplifies constructs of race and ethnicity, and can essentialize the experiences of diverse individuals identifying as from different races and cultures (Banks, 2015). However, given the long history of racism in the United States and its direct harmful impact on students of color (Ladson-Billings, 2006), such a variable may also help identify inequalities that harm students of color. That said, this research should be balanced with other approaches that investigate the experiences of students of color in addition to students from other backgrounds harmed by oppression and marginalization.

After an initial multiple regression model was created for each of the three dependent variables of interest, one to two additional multiple regression models were created for comparison using a variable deletion approach. Independent variables were deleted from the initial models based on their impact on sample size or lack of significant coefficients. The details of the deletion approach and resulting models for each dependent variable are included in chapter five.

Although multiple regression was used to analyze the relationship between the intervention and on-time assessment completion, time management self-efficacy, and grades for question two of the outcome evaluation, difference in means tests were used instead to compare the treated and untreated groups by undergraduate GPA and by gender for questions three and four. Although difference in means tests cannot control for covariates, the smaller sample sizes of the subgroups referred to by questions three and four (i.e., male students and students with

low undergraduate GPAs) made difference in means tests more appropriate than multiple regression models. For each comparison, either a Mann-Whitney U test or a *t* test was used, depending on the distribution of data within the comparison groups. Details of the tests used for each comparison can be found in chapter five.

Neither regression nor difference in means tests could be used with course completion as a dependent variable since it is a categorical variable. Instead, to assess the relationship between participation in the intervention and course completion, both among the full sample of participants and among gender- and GPA-based subgroups, Chi-squared tests of association were initially used. However, in every case in which a chi-squared test was initially used, there was at least one cell in the comparison matrix with an expected value below five, so the Fisher's exact test was interpreted instead in each case.

Qualitative data analysis. Thematic analysis, or analysis of qualitative data that involves the use of codes to identify themes (Braun & Clarke, 2006), was used with all qualitative data. However, some qualitative data were analyzed inductively and other qualitative data were analyzed deductively. Inductive analysis means that data are analyzed without any pre-identified codes and thus without any preconceived themes (Braun & Clarke, 2006). Inductive analysis is therefore appropriate for analysis that is exploratory. As such, inductive analysis was applied to faculty responses to open-ended items in the faculty implementation questionnaire (see Appendix G) as well as participant responses to open-ended items in the post-intervention questionnaire (see Appendix I). The open-ended items on the faculty implementation questionnaire were designed to reveal barriers that faculty members experienced while facilitating the intervention and variation in faculty facilitation. An exploratory approach to analyzing responses to these items ensured that neither barriers nor variations in facilitation,

whether beneficial or harmful, were missed due to a narrow analysis lens. Similarly, the open-ended items about the goal setting and MCII activities on the post-intervention questionnaire in Appendix I were designed to learn about participant experience with the intervention, and consequently were suited to an inductive approach that allowed for the identification of codes and themes based on what participants shared as opposed to what the researcher predicted.

Conversely, deductive analysis was applied to qualitative data when the data were being analyzed relative to specific, pre-identified criteria. Deductive analysis involves the pre-identification of codes. Codes may also be inductively added (Hsieh & Shannon, 2005), but the researcher goes into the qualitative analysis process looking for something specific (Braun & Clarke, 2006). For example, participant writing in the initial goal setting activity and digital MCII worksheets was analyzed for specific qualities, such as the specificity and feasibility of goals. As such, deductive thematic analysis was used with qualitative data from the initial goal setting activity and digital MCII worksheets. Deductive thematic analysis was also used with qualitative data collected in the descriptive portion of the observation form (i.e., to assess quality of delivery of the intervention based on predefined characteristics).

Because all qualitative data are in the form of written responses from participants or written observation field notes, no transcription of oral responses was required before coding. The first round of coding applied to all qualitative data was descriptive, which involves the assignation of descriptive codes to chunks of data (Miles, Huberman, & Saldaña, 2013). For inductively coded qualitative data, in vivo codes, meaning codes that come directly from participants' own words, were sometimes used in the first round of coding (e.g., "fun and easy" to describe what one participant found the most useful about the intervention). Initial coding was applied to participant writing line by line.

Following the initial round of coding, codes were revised iteratively until a comprehensive list of codes was established. For example, when the code "issue" was applied to several lines of qualitative data from observations, it encompassed a variety of different challenges that came up during observations. Therefore, splitting the single code into subcodes (e.g., "link" and "timing") was warranted (Miles et al., 2013). For process evaluation data, after qualitative data were coded, relationships between codes were explored. Based on identified relationships, codes were grouped into themes for further analysis. For example, themes from observational data included quality of delivery indicators, facilitation issues, and logistical supports.

Codes in the outcome evaluation were evaluative; for example, the codes "yes," "no," and "unclear" were applied in the assessment of whether goals were specific and feasible. After the initial round of coding, subcodes were sometimes added to ensure consistency in the application of the first-level codes (e.g., to ensure all goals that referenced the completion of a concrete task were coded "yes" for specificity). After coding, counts of evaluative codes were analyzed to answer research question one in the outcome evaluation.

Study Limitations

Although the evaluation study was designed to isolate the effect of the intervention to the extent possible, the study design included three key limitations. First, the quasi-experimental approach to the outcome evaluation may have introduced selection bias, for example, because participants were not randomly assigned (Shadish et al., 2002). To minimize selection bias, variables beyond participant assignment to a treated or untreated group were measured and included during the data analysis phase of the intervention. Table 9 includes a list of predictor variables, which were all chosen for their potential to influence the intended outcomes of the

intervention. The inclusion of some of these predictor variables as covariates in multiple regression models helped control for potential confounding factors that may have influenced outcomes. However, not all predictor variables were included in multiple regression models, and multiple regression was not used for the analysis of every outcome.

Second, although measurement of multiple outcomes (i.e., time management skills, time management self-efficacy, course grades, and course completion) allows for better understanding of how an intervention works, measurement of multiple outcomes also increases the odds of finding at least one result that appears statistically significant but is actually due to chance (Shadish et al., 2002). To account for this limitation, results for each component of research question two are reported in the next chapter regardless of whether statistical significance was established. Inferences were drawn based on all results, not just those that were statistically significant.

Third, qualitative data from participants included writing only, and did not include interview data. Although interviews can enhance the richness of qualitative data and introduce opportunities for triangulation, focusing on participant writing allowed for the most important constructs to be explored while maintaining feasibility in the data collection plan. However, depending on the results of this study, interviews may be prioritized in a follow up study. Additional limitations based on the intervention's implementation are discussed in Chapter 5, next.

Conclusion

In addition to the limitations identified, the quasi-experimental design embedded in the broader convergent parallel mixed methods approach also included strengths. First, the use of a comparison group design, despite the limitation of nonrandom assignment, strengthened the

inferences drawn about the influence of the intervention on intended outcomes as compared to a single group design (Henry, 2010). Second, the inclusion of qualitative data collection and analysis, both as part of the process evaluation and to answer the first outcome evaluation question, also strengthened the inferences drawn about the intervention. Consequently, the mixed methods evaluation study described in this chapter yielded valuable information for understanding and assessing the time management intervention.

Chapter 5

The purpose of this study was to evaluate an intervention designed to improve time management and associated outcomes among students taking online courses at a graduate school of education. To assess whether the intervention was implemented as designed and whether it may have contributed to positive time management-related outcomes for students in online courses, both a process and outcome evaluation were conducted. The outcome evaluation also assessed the intervention's outcomes for GPA- and gender-based subgroups to determine if the intervention could be used to support students with low GPAs and male students in particular, and thus address the challenges identified in the problem of practice and needs assessment. This chapter describes the implementation of the intervention and the process and outcome evaluation findings, as well as discusses the potential reasons for and implications of the findings and the connections between the process and outcome evaluations.

Implementation Process

The intervention was implemented largely as planned. There were no deviations from the plan presented in Chapter 4 for recruitment, training, survey administration, or collection of data from institutional sources (i.e., the learning management and student information systems used by the graduate school). In fact, data collection proceeded as planned with one exception. Specifically, although the practitioner researcher planned to observe all 11 instructors who volunteered to facilitate the intervention, only six were observed due to limitations introduced by the practitioner researcher's own teaching schedule. During the recruitment phase of the intervention, 156 of a possible 487 graduate student participants agreed to participate in the study by signing a consent form, resulting in a participation rate of 32%. No faculty or graduate student participants chose to withdraw from the study. Appendix J includes a comparison of treated and

untreated group according to demographic variables and pre-intervention time management self-efficacy.

The intervention's key components, the goal setting activity and all four of the planned MCII exercises, were implemented across most, but not all, class sections receiving the intervention, and with only small deviations from the theory of treatment. The online class sections of all 11 instructors implementing the intervention received the goal setting activity as planned, as an asynchronous activity at the beginning of the term. Nine of the 11 instructors implementing the intervention facilitated all four planned MCII exercises in their class sections during the 2019 fall term, and two did not. Data from observations and instructor surveys also indicated that with small exceptions (e.g., a failure to remind students to pick a wish related to online coursework during one MCII exercise), MCII exercises were implemented with fidelity. However, student and instructor data also suggested that sufficient time for intervention activities was a challenge. The details of the extent to which the intervention implemented matched the planned intervention, including the major trends described in this paragraph, are further explored in the process evaluation.

Findings

Process Evaluation

The process evaluation for the intervention focused on the intervention's implementation, with the following research questions:

1. To what extent did the actual intervention match the intervention as planned?
2. How much of the intervention did participants engage in?

3. How did participants in treated and untreated groups compare in terms of use of non-intervention time management resources and perceptions of job, personal, and school workloads?

The following sections present the findings for each process evaluation research question.

Research question one. The first research question assessed the intervention's implementation in terms of adherence and quality of delivery. Adherence refers to the extent to which an intervention's implementation matched its plan, and quality of delivery refers to the extent to which the delivery matches the theory of treatment (Dusenbury et al., 2003; see Chapter 4 for additional detail). Because the goal setting activity was asynchronous, all components were implemented exactly as designed. The goal setting activity was added as a beginning of term assignment in every course taught by each of the 11 instructors who agreed to implement the intervention. Therefore, adherence was achieved. The prompts in the goal setting activity were precisely worded based on the theory of treatment and presented to all students in exactly the same way because the activity was asynchronous. Specifically, the prompts were based off those used by Morisano et al. (2010) and Schippers et al. (2015), and asked participants to:

- Imagine an ideal future at three different points in time (six months, two years, and five years in the future)
- Imagine a counter-vision to the ideal for each point in time
- Reflect on things they would like to learn, habits they would like to improve, and ways they would like to spend time in the next six months
- Set three to six goals for the next six months (across the domains of school, work, and personal life) and identify strategies for achieving these goals

Therefore, quality of delivery was achieved for the goal setting activity. In contrast to the goal setting activity, MCII activities were facilitated by instructors during synchronous class sessions, meaning that neither adherence nor quality of delivery were guaranteed.

MCII adherence. In terms of adherence, 11 instructors ran the intervention. As shown in Figure 12, of these 11, nine instructors ran the intervention with a single class section and two instructors ran the intervention with two different class sections. Each instructor was asked to facilitate MCII activities approximately once a month, for a total of four times across the term (i.e., August through December), in each class section. If each instructor implemented the intervention with complete adherence, the MCII exercise should have been implemented 52 unique times during the term (i.e., four times for each of the nine instructors implementing the intervention with one class and eight times for the two instructors implementing the intervention with two classes). In actuality, instructors facilitated the MCII activity 48 times over the course of the intervention, as shown in Figure 12.

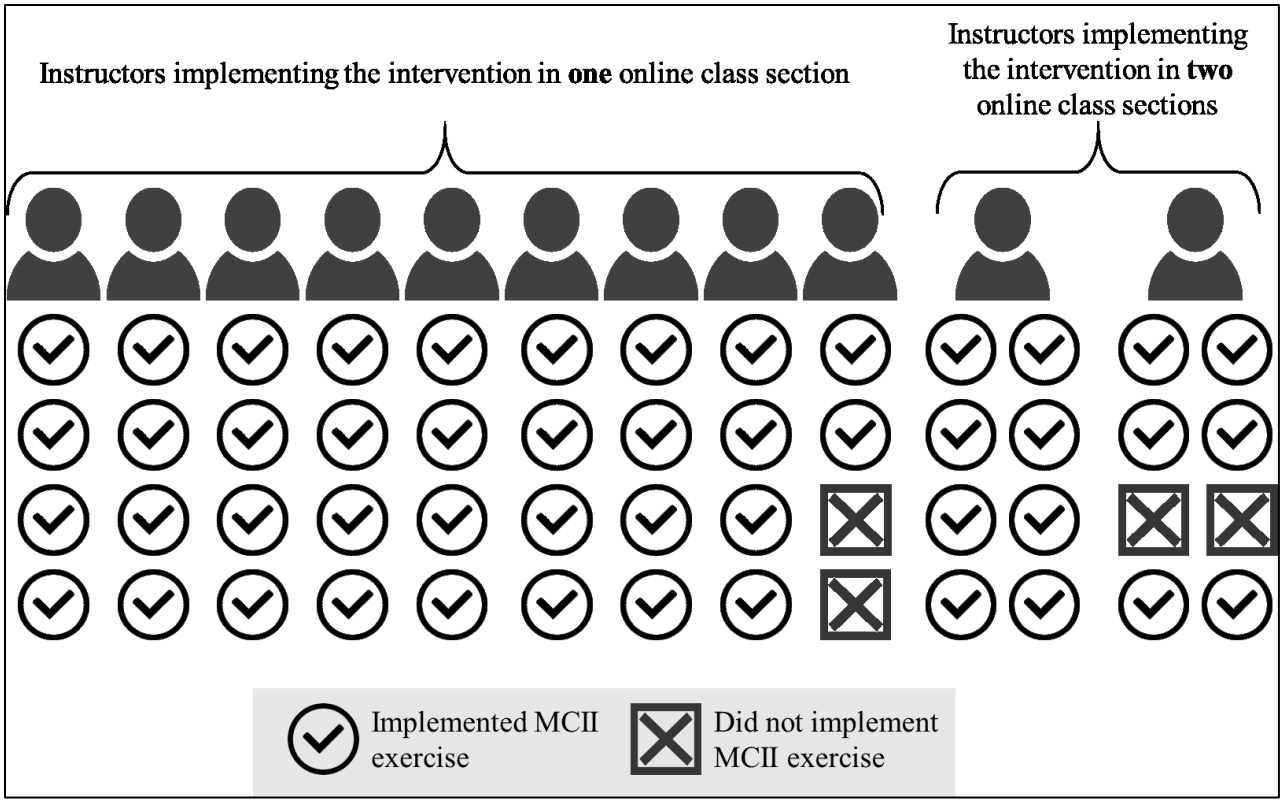

Figure 12. Implementation of MCII exercises across 11 facilitators.

Two of the nine instructors each missed two planned MCII implementation dates. The first of these instructors implemented the intervention with two class sections and did not implement MCII for either section during their planned facilitation week in November (i.e., the instructor implemented an MCII activity three rather than four times across the term in each of their two class sections). This instructor indicated on the implementation questionnaire that they simply forgot to add the activity to class materials in November, and had no other reason for skipping facilitation. The second instructor who did not facilitate all planned MCII activities implemented the intervention for one class section, but did not facilitate an MCII activity on either of their planned dates in November or December (i.e., the instructor implemented an MCII activity two rather than four times across the term in his class). Questionnaire responses from this instructor

indicated that they forgot to implement the MCII activity in November, and had to cancel class on the planned implementation day in December.

Instructor questionnaire data also provided information on the components of the MCII activity facilitated in each class session. Instructors were asked to complete the implementation questionnaire (see Appendix G) after each MCII exercise that they facilitated. The questionnaire completion rate was 91%. Excluding responses from the two instructors noted above on the weeks in which they did not facilitate an MCII exercise at all, instructor questionnaire data indicated that instructors asked students to revisit their goal setting activities before engaging in the MCII exercise 84% of the time, facilitated all steps of the MCII activity 100% of the time, and gave participants time to write down key words for each step of the MCII exercise 97% of the time. Observational data indicated similar trends. Of the six instructors observed, 100% facilitated all steps of the MCII activity and gave students time to write down key words for each step. Five of the six instructors gave students time to revisit their goal setting activities from the beginning of the term before engaging in the MCII exercise. The sixth referenced the goal setting activity when framing MCII, but did not give students time to revisit it.

MCII quality of delivery: observational data. Data from observations and instructor surveys were used to assess quality of delivery. Because data were evaluated against specific indicators related to the theory of treatment, a deductive approach was used first to code observational notes (Hsieh & Shannon, 2005), after which additional inductive codes were defined and applied based on the data. Table 10 shows the deductive codes, all of which relate to the theory of treatment and therefore indicate quality of delivery.

Table 10

Deductive Codes for MCII Observational Data

Code	Definition	Inclusion Rationale
Audio Script	Facilitator played the facilitation audio	The audio recording was created by an MCII researcher (Oettingen, 2014) and included directions that encompassed elements critical to the theory of treatment (e.g., it included language that encouraged participants to determine a wish that was feasible to achieve)
Goals	Facilitator framed activity in achievement of goal(s)	The theory of treatment calls for MCII exercises to be framed in terms of personal goals to promote the selection of desirable wishes, which are necessary for success with the MCII exercise (Oettingen, 2012)
Feasible	Facilitator guided participants to write achievable wishes	Wish feasibility is part of the theory of treatment because feasible wishes support the success of MCII exercises by strengthening participants' associations between potential obstacles and the plans that can be implemented to overcome them (Kappes et al., 2012; Kappes et al., 2013)
Focus	Facilitator guided participants to write a wish related to online coursework in some way	The medium- and long-term outcomes in the theory of treatment are related to online coursework, so for MCII to support these outcomes, participants needed to focus on online coursework
Read Script	Facilitator read the facilitation script aloud	The facilitation script was created by MCII researchers (Character Lab, 2019) and included directions that encompassed elements critical to the theory of treatment (e.g., it included language that encouraged participants to determine a wish that was feasible to achieve)
Specific	Facilitator guided participants to write specific wishes	Wish specificity is part of the theory of treatment because similar interventions that have been successful included specificity as a focus (Morisano et al., 2010; Schippers et al., 2015).

Deductive coding made sense for the first round of coding of observational data because the data were being analyzed relative to specific characteristics of quality of delivery. After deductive coding, the addition of inductive codes can help the researcher identify additional, unanticipated trends (LeCompte & Goetz, 1982). In the case of the observational data, inductive

coding surfaced additional potential facilitators of as well as barriers to quality of delivery. Appendix L shows the full set of codes used for the observational data, including examples for each code. Based on the full set of codes, three themes were identified: quality of delivery indicators, facilitation issues, and logistical supports.

Quality of delivery indicators. All the deductive codes in Table 10 were categorized as quality of delivery indicators due to their representation of the theory of treatment. Only one additional code was inductively added to this theme: example. The example code was used to indicate when a facilitator had participants refer to a sample completed MCII exercise, which can be seen in Appendix K. The sample completed exercise, created by MCII researchers (Character Lab, 2019), supported quality of delivery because it included a wish that was feasible and specific, an obstacle that might prevent the achievement of the wish, and an aligned plan for overcoming the obstacle.

Analysis of the codes within the quality of delivery indicators theme indicated that all six facilitators who were observed framed the MCII activity in terms of achievement of goals. Five of the six also either played the audio recording or read the facilitation script aloud to guide participants through each step of the MCII exercise. The sixth facilitator neither played the audio nor read the script. Rather, as this instructor facilitated the exercise, they encouraged participants to create focused and specific wishes and referenced the sample completed activity, thus indicating aspects of quality of delivery. However, this instructor did not encourage participants to create feasible goals.

Although the audio recording and verbal facilitation script encompassed most aspects of quality of delivery, they did not include context-specific directions, such a direction to choose a wish relevant to online learning. However, four out of the six facilitators observed directed

participants to write a wish specific to their online class. Although all observations included multiple indicators of quality of delivery, at least one facilitation issue arose in each observation, details of which are described in the next section.

Facilitation issues. Table 11 shows the codes that fell within the theme of facilitation issues, all of which were inductive. Appendix L includes examples taken directly from observational notes for each of the codes in Table 11. As shown in Table 11, each issue occurred, at most, in two separate observations. The "link" code, which indicated the facilitator could not access the script she intended to use, applied to the one facilitator who did not either play the audio recording or read the script for the MCII exercise, as described in the previous section.

Table 11

Facilitation Issues Codes for MCII Observational Data

Code	Definition	# of Observations to Which Code was Applied
Direction	Facilitator gave a direction that could cause a fidelity issue	2
Link	Link to facilitation script was broken	1
Materials	Facilitation materials could cause confusion	1
Student Tech	Student(s) had technology issues that prevented them from fully participating	1
Timing	Facilitator moved on before all participants had completed a step	2
Working Ahead	Participants wrote in step(s) before the facilitator gave directions for the step(s) in question	2

The "timing" and "direction" codes in Table 11 indicated potential barriers to quality of delivery. For timing, if the facilitator moved on before the participants finished thinking through a given step of the MCII exercise, participants were unlikely to get the benefits of this step. In

both instances in which the timing code applied, it was only at the very last step of the exercise (i.e., planning) that the issue arose. Additionally, in one of the two instances, observational notes indicated that although some students were still writing, they were likely finishing their thoughts.

Like the timing code, the direction code only applied to a single step of the MCII exercise in each observation in which it came up. In the first instance, a participant asked the facilitator if they could write any sort of wish. The facilitator responded by stating the wish could be anything important that was also difficult but achievable. However, this response implied that the wish did not need to relate to online coursework, therefore reducing the quality of delivery. The second directions issue arose in the observation of the facilitator with the broken link to the script, who was also the only facilitator among those observed who did not play the audio or read directly from the script for the MCII exercise. In this case, when giving the direction for the obstacle step, the facilitator described that the obstacle should be a barrier to achieving the wish, but did not mention that the obstacle should be within the participant's locus of control, which was part of both the audio recording and facilitation script.

The "materials" code, which applied to a mismatch between materials and the audio directions, indicated another potential threat to quality of delivery. However, the mismatch was minor. Whereas the materials designed to guide participants' writing prompted participants to create a plan using a "when, then" format (e.g., "When I finish dinner, then I will make 15 flashcards;" Character Lab, 2019), the audio recording referenced an "if, then" format. Observational notes indicated that this minor discrepancy did not appear to influence participant plans negatively.

Finally, the "student tech" and "working ahead" codes were not indicative of threats to quality of delivery because they related to student rather than facilitation issues. Although

student issues are worth noting, the issues associated with these codes were not likely to threaten the overall effectiveness of the MCII exercises. The student tech code was applied in one observation in which two students indicated they could not record their thoughts because of load time and freezing issues with their Internet browsers. However, the issue only seemed to persist for one student, who was still able to hear the facilitator and thus had the opportunity to complete the MCII exercise by thinking through each step. The working ahead code was applied to two observations. In the first of these instances, the facilitator had participants look at written directions and the example before beginning, so even if participants were not fully attending to the facilitator as she read the script, they still received directions aligned to the indicators of quality of delivery. In the second instance in which participants worked ahead, participants had already engaged in the MCII exercise twice before, in previous months, indicating that they may have simply been familiar with the protocol and not needed the verbal directions to complete the exercise.

Logistical supports. The last theme identified based on observational data revealed that most facilitators added directions that helped participants engage in MCII exercises by providing cues about timing or about organization of materials. The codes associated with this theme can be found in Appendix L, and were exemplified by observational notes such as "When you have that feeling in mind, please write it in the box next to your wish," and "Take another minute and wrap up what your thoughts are for your plan." Such cues likely enhanced quality of delivery by helping participants focus attention on the MCII exercise.

MCII quality of delivery: questionnaire data. Facilitator responses to open-ended questionnaire items (see Appendix G) provided additional information on quality of delivery. The two open-ended items on the questionnaire asked facilitators to give a rational for any

portions of the MCII activity that they skipped and to describe whether they changed their facilitation at all from the previous month. Responses were inductively coded to allow for an exploratory approach to identifying trends. Based on the codes, three themes were identified: implementation issues, implementation improvements, and neutral descriptions of implementation. Table 12 includes each code, grouped by theme.

Table 12

Codes Applied to MCII Facilitator Questionnaire Responses

Code	Definition	Example Questionnaire Response
	Improvements	
Faster	Implementation required less time than previous rounds	It went slightly faster because students had experience with the worksheet.
Feedback	Facilitator gave feedback to help participants	I did pause some students who skipped the if section and gave more direction to help them better name their potential obstacle.
Focus	Facilitator directed participants to pick a wish related to online coursework	I added in specific references to the coursework when framing the steps of WOOP.
Plan	Facilitator improved directions for the plan step	I provided more clarity on the "When" column of the plan, saying, "When you encounter your obstacle you will plan to..."
Time	Facilitator gave students more time to engage in the activity	I gave students more think time
	Issues	
Feedback	Facilitator did not give feedback when it was warranted	I didn't give meaningful feedback to direct off-topic responses
Goal Setting Activity: Completion	Participants did not all have a goal setting activity to revisit because not all of them had completed the goal setting activity	only around 50% had completed the initial goal setting activity.

Code	Definition	Example Questionnaire Response
Goal Setting Activity: Relevance	Revisiting the goal setting activity did not feel relevant	I did not ask students to revisit their original goal, because I wanted them to be able to think about a goal that is more relevant for where we are in our coursework now (that they would not have necessarily known about when they set their original goals).
Goal Setting Activity: Time	There was not enough time for review of the goal setting activity	Because of pacing, we did not have time to revisit the initial goal setting activity.
Overall Time	There was not enough time for implementation	Just quickly framed and played the recording since we were running really short on time.
Script	The facilitator did not have the facilitation script	I didnt have the script available, but I was able to improvise.
	Neutral	
First Time	No change from previous implementation because this was the first time the facilitator implemented MCII	This was the first time I facilitated it
No Change	No change from previous implementation	Nope. same process!

Overall, the improvement codes suggested strengthened quality of delivery, whereas the issue codes suggested potential problems with quality of delivery. Excluding the responses indicating the facilitator did not implement an MCII exercise in a given month at all (see previous section on adherence for more detail), 50% (n = 20) of questionnaires indicated that it was either the first time the facilitator implemented the MCII exercise or that they made no changes from their previous implementation. Thirty-five percent indicated the facilitator made an improvement relative to their previous implementation, Eighteen percent indicated the facilitator had a time-related issue (i.e., as indicated by the codes "goal setting activity: time" and "overall time") and 13% indicated that the facilitator had some other kind of issue (i.e., as indicated by any of the other issue codes).

Questionnaire data provided complimentary information to the observational data, allowing for triangulation of findings. For example, one instructor was observed to have an issue accessing the link to the facilitation script and also noted this issue in her questionnaire. This was the only time the issue arose in either observational or questionnaire data, indicating that it was not likely widespread. Additionally, two of the six instructors observed moved on with their facilitation before participants appeared to have completed a step of the process. Questionnaire data, which indicated that facilitators felt that they did not have enough time for some or all of the MCII activity in 18% of cases, could explain this trend. Issue codes other than those specific to timing were applied, at most, to two questionnaires out of the 40, whereas the timing issue code came up in seven questionnaires. Therefore, timing may have been a barrier to quality of delivery, although it did not apply to the majority of observations or responses.

Research question two. The second research question assessed the intervention's implementation in terms of dose and participant responsiveness. Dose refers to how much of the intervention participants received and participant responsiveness refers to how engaged participants felt as they took part in the intervention (Dusenbury et al., 2003; see Chapter 4 for additional details). As with the first research question for the process evaluation, dose and participant responsiveness were assessed for both the goal setting activity and for the MCII exercises.

***Dose: goal setting activity*.** Dose for the goal setting activity was assessed based on completion. The goal setting activity included four writing prompts for participants. Four participants did not respond to any of the prompts, one participant responded to one out of the four prompts, and one participant responded to two out of the four prompts. The remaining 83 participants (93%) completed the full goal setting activity by responding to all four prompts.

Dose: MCII exercises. Dose for the MCII exercises was assessed based on attendance during class sessions in which an MCII activity was facilitated. If the instructor failed to facilitate a planned MCII exercise at all, all students in the given class section were coded as not receiving the exercise. On average, participants received (i.e., were present for) 3.2 exercises out of the four planned MCII exercises, which exceeded the dose goal set in the planning stages of the intervention. However, only 46% of participants (n = 41) were present for all four MCII exercises and 28% (n = 25) were present for three out of the four MCII exercises. Approximately one quarter of the participants were present for half or less of the MCII exercises. Of the total participants, 21% (n = 19) were only present for two exercises and 4% (n = 4) were only present for one exercise. No participants missed all four MCII exercises. Although participants, on average, exceeded the initial goal set for dose (i.e., participants being present for an average of at least three of the four MCII exercises), the 26% of participants who were only present for one or two MCII exercises indicated a potential issue with dose.

Participant responsiveness: goal setting activity and MCII exercises. Participant responses on the post-intervention questionnaire (see Appendix I) were used to assess responsiveness to both the goal setting activity and MCII exercises. Of the 89 participants who were in the group that received the intervention, 48 completed the post-intervention questionnaire for a response rate of 54%.

Three closed-ended items on the questionnaire were used to assess participant responsiveness. Each closed-ended item had a response scale ranging from one, for strongly disagree to six, for strongly agree. Table 13 shows descriptive statistics for responses to these items. The first two items in Table 13 relate to participant responsiveness to MCII exercises and the last item relates to participant responsiveness to the goal setting activity.

Table 13

Descriptive Statistics for Participant Responsiveness Items

Item	*M*	Response Distribution % (*n*)					
		(1)	(2)	(3)	(4)	(5)	(6)
I fully engaged during the WOOP activities that occurred during synchronous sessions in my online class (i.e., I thought through each step of the WOOP cycle and felt interested and engaged in the process)	4.35	6.3% (*3*)	4.2% (*2*)	2.1% (*1*)	35.4% (*17*)	39.6% (*19*)	12.5% (*6*)
Revisiting the goals I wrote at the beginning of the term before each WOOP activity was useful	4.17	6.3% (*3*)	8.3% (*4*)	12.5% (*6*)	22.9% (*11*)	35.4% (*17*)	14.6% (*7*)
I fully engaged in the initial asynchronous goal setting activity (the one you revisited before each WOOP activity) in my online class (i.e., I thought through each prompt and felt interested and engaged in the activity)	4.26	6.4% (*3*)	8.5% (*4*)	6.4% (*3*)	21.3% (*10*)	46.8% (*22*)	10.6% (*5*)

Note. Participants engaged in MCII exercises using the acronym WOOP; which stands for wish, outcome, obstacle, plan (Character Lab, 2019).

In addition to the closed-ended items in Table 13, two open-ended items were used to assess participant responsiveness to the goal setting activity and MCII exercises:

- What were the most useful aspects of the goal setting and WOOP activities? Why?
- What were the least useful aspects of the goal setting and WOOP activities? Why?

Participant responses to these items were inductively coded to allow patterns to be identified through exploration of participant writing.

Of the 48 participants who responded to the questionnaire, five did not respond to the item about the most useful aspects, and three gave a response indicating they did not find anything useful (e.g., “I did not find the WOOP activities useful.”). The remaining 40 respondents all identified at least one useful aspect of the intervention. Table 14 shows the codes

applied to participant responses about what was most useful, in order from most to least common.

Table 14

Codes for Participant Perceptions of Most Useful Aspects of Intervention

Code	Definition	Example from a Participant Response	Count
Goal	Setting a goal or wish	It was helpful to plan out the goals as wish etc	20
Plan	Creating a plan to overcome obstacles and achieve goals or wishes	Setting a realistic action step	11
Reflection	Engaging in reflection	Stopping and reflecting	7
Obstacle	Identifying an obstacle that could get in the way of goal or wish attainment	considering the obstacles I may face in reaching my goals	7
Time	Having specific time allocated for intervention activities	Taking the time to stop, focus, and set (or reset) a direction.	6
Accountability	Gaining a sense of accountability for goals or wishes	It…held me accountable.	4
Revisit	Revisiting previous writing associated with the intervention	reviewing my goals	4
Growth	Achieving or seeing growth	It's good to see growth.	3
Motivation	Experiencing motivation	was helpful and motivating.	3
Posting	Posting goals or wishes (i.e., rather than just thinking about them)	Able to post your goals was almost like putting them out into the universe.	3
Time Management	Improving time management	Making a plan for better time management	2
Fun and Easy	In vivo code defined based on a single participant response that did not fall into another category	It helped me get my brain ready for class by doing something fun and easy.	1
Perspective		It gave me perspective and made things feel less overwhelming.	1
Relaxing		Relaxing	1

More than half of participants who responded to the item about what was most useful identified more than one useful aspect of the intervention (n = 24). For example, the following participant response was coded with "goal," "growth," and "revisit": "Setting and reviewing my goals because I was able to see how much I accomplished." Overall, participants seemed to find the portion of the intervention that prompted them to set goals to be its most useful aspect, although participant responses varied.

The item asking participants what they found least useful about the intervention was analyzed in a similar way. Of the 48 participants who completed the questionnaire, five did not respond to the item about the least useful aspects of the intervention, and 19 indicated there was nothing that was least useful about the intervention (e.g., "None."). The remaining 24 respondents all identified at least one least useful aspect of the intervention. Table 15 shows the codes applied to participant responses about what was least useful, in order from most to least common.

Table 15

Codes for Participant Perceptions of Least Useful Aspects of Intervention

Code	Definition	Example from a Participant Response	Count
Accountability	Needed more accountability	There was not enough accountability or being held accountable as a student to stick to the plan. A midway check-in would have been nice.	8
Time: Not Enough	Insufficient time	I would have liked to have more time to reflect.	5
Everything	No aspects of the intervention were useful	All	2
Online	Format was online rather than face-to-face	The least useful was not writing it down on a piece of paper and putting up on my board to physically see. I only had it online	2

Code	Definition	Example from a Participant Response	Count
Time: Too Much	Too much time	For some prompts, we were given a little too much time and I got distracted from thinking about my goal.	2
Didn't Work	Intervention did not lead to intended outcomes	My outcomes weren't changed	1
Disjointed	Intervention was not integrated well into existing coursework	They seemed just inserted into the lecture making it hard to fully focus at times.	1
Revisit	Did not get to revisit previous rounds	Vist the previous whoop at least once before entering the new wool [sic]	1

Unlike the participant responses to the item asking what was most useful about the intervention, most participants only identified one aspect of the intervention that was least useful. Only two participant responses received multiple codes. For example, "More time to complete. Vist the previous whoop at least once before entering the new wool [sic]. A reminder!" was coded as "time: not enough," "revisit," and "accountability." Overall, participants most frequently identified a desire for some form of additional accountability associated with the intervention as an issue, followed by a desire for more time. Although four participants noted that the intervention did encourage accountability in response to the previous item, eight participants noted lack of accountability as an issue. Similarly, although six participants identified that having time allocated for the intervention was useful, five indicated that there was not enough time provided for the intervention. In contrast, two other participants noted that too much time was provided for intervention activities.

Insufficient time also arose as a potential issue based on analysis of participant writing in the MCII exercises. Only 1% of participants who wrote goals in the first round of the MCII exercises did not write a plan, but between 15% and 18% who wrote goals in the second through fourth rounds of the MCII exercises did not write plans. Because writing goals was the first step

of MCII exercises and writing plans was the last step of the exercises, this trend indicates that a portion of participants may have run out of time in each round of MCII, especially during rounds two through four.

Research question three. The third research question assessed the intervention's implementation in terms of context. Context refers to contextual factors unrelated to the intervention that might influence the outcomes of the intervention (Leviton & Lipsey, 2007; see Chapter 4 for additional detail). Participant responses on the post-intervention questionnaire were used to assess context. As noted in the section above, for participants in the treated group, the response rate to this questionnaire was 54%. Of the 67 participants in the untreated group, 29 completed the post-intervention questionnaire for a response rate of 43%.

Time management resource use. Because the intervention was designed to support time management, participant use of time management resources outside of the intervention could have plausibly influenced the intervention's intended outcomes. On the post-intervention questionnaire, participants in both the treated and untreated groups were asked whether they completed *The Together Teacher*, an asynchronous online learning module available to all students at the institution that included time management resources such as calendar templates. Participants were also asked if they used any other time management resources. Tables 16 and 17 show comparisons between the treated and untreated groups in terms of use of time management resources outside the intervention itself. All percentages in Tables 16 and 17 are reported relative to the total number of survey respondents ($N = 48$ for treated group; $N = 29$ for untreated group).

Table 16

Participant use of Time Management Resources Outside the Intervention

	Treated Group % (*n*)	Untreated Group % (*n*)
Did not use an outside time management resource	60.4% (*29*)	65.5% (*19*)
Used both *The Together Teacher* and another time management resource	4.2% (*2*)	17.2% (*5*)
Used *The Together Teacher* only	14.6% (*7*)	6.9% (*2*)
Used another time management resource only	20.8% (*10*)	10.3% (*3*)

Table 17

Amount of The Together Teacher Completed

	Treated Group % (*n*)	Untreated Group % (*n*)
Completed all	10.4% (*5*)	13.8% (*4*)
Completed more than half	0% (*0*)	0% (*0*)
Completed about half	2.1% (*1*)	3.4% (*1*)
Completed less than half	6.3% (*3*)	6.9% (*2*)
Total	18.8% (*9*)	24.1% (*7*)

If a participant indicated they used another time management resource, they were asked what it was. Inductive coding was then applied to identify the other resources used. Among participants in the treated group who completed the questionnaire, 25% (n = 12) indicated that they used at least one other time management resource. Of these, seven indicated using a calendar, four indicated using a planner, two indicated going to a person for support, and one indicated using instructor emails. In comparison, among participants in the untreated group who

completed the questionnaire, 28% (n = 8) indicated that they used at least one other time management resource. Of these, six indicated using a planner, two indicated using a calendar, one indicated visiting a website with time management resources, and one indicated using both a gratitude journal and a "time matrix," which was not explained.

Overall, a higher percentage of participants in the treated group used a time management resource outside of the intervention (i.e., either from *The Together Teacher* or a different source) compared to those in the untreated group. However, this difference was not large (i.e., 39.6% in the treated group compared to 34.5% in the untreated group). A chi-squared test revealed no significant association between receiving the intervention and using outside time management resources, X^2 (1, N = 77) = 0.20, p = .654. The most common additional time management resources beyond the intervention and *The Together Teacher* identified in both the treated and untreated groups were calendars and planners.

Workload perceptions. Because time management relates to workload (e.g., time may be more difficult to manage if workload is higher), participant workload could also plausibly have influenced intervention outcomes. Although workload was not measured directly, the post-intervention questionnaire asked participants in both the treated and untreated groups to rate their workloads in different domains. Table 18 shows comparisons between the treated and untreated groups in terms of perceived workload. All items included a response scale from one, strongly disagree, to six, strongly agree.

Table 18

Participant Perceptions of Workload

Item	*M*	*SD*	Minimum	Maximum
Treated Group				
Overall, my workload associated with personal responsibilities (e.g., child or elder care, grocery shopping, paying bills, etc.) is manageable.	3.83	1.17	1	6
Overall, my workload at my school is manageable	3.71	1.20	1	6
Overall, my workload at Relay GSE is manageable	4.25	.98	2	6
Untreated Group				
Overall, my workload associated with personal responsibilities (e.g., child or elder care, grocery shopping, paying bills, etc.) is manageable.	3.86	1.36	1	6
Overall, my workload at my school is manageable	3.45	1.18	1	5
Overall, my workload at Relay GSE is manageable	3.86	1.13	1	6

The largest difference between the treated and untreated groups was in their perception of workload at the graduate school, with the treated group rating their workload as more manageable, on average. The average perception of manageable workload at the graduate school among members of the treated group fell between somewhat agree (4) and agree (5), whereas all other averages in both groups fell between somewhat disagree (3) and somewhat agree (4). However, for the aggregate measure of workload perception (i.e., the mean of the three items in Table 18), results from a *t* test indicated the difference between the treated group and untreated group was not significant, $t(75) = -0.91$, $p = .364$.

Outcome Evaluation

The following questions were used to assess the intervention's intended outcomes:

1. To what extent were graduate students able to set specific, feasible, and desirable goals; and plan to overcome potential obstacles that might stand in the way of goal achievement?
2. In what ways did the time management intervention influence the time management skills, time management self-efficacy, course completion, and grades of graduate students taking online courses?
3. To what extent did the answers to question two vary for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs?
4. To what extent did the answers to question two vary by gender?

The sections that follow present the findings of the outcome evaluation relative to these research questions.

Research question one. The intended short-term outcomes of the time management intervention, as defined in the theory of treatment (see Figure 11), included increases in participants' ability to set specific, feasible, and desirable goals; and in their ability to identify obstacles that may interfere with achievement of goals and plan to overcome them. The first research question of the outcome evaluation corresponded to these intended short-term outcomes. Specificity and feasibility of goals as well as the extent to which participants identified actionable obstacles with aligned plans were assessed using participant writing. Desirability of goals, however, was assessed via an item on the post intervention questionnaire (see item two in Appendix I) because desirability relates to participant perception rather than a quality of the written goal.

Goal specificity. To assess goal specificity, "yes" and "no" codes (i.e., is the goal specific or not) were applied to goals written as part of the initial goal setting activity and each MCII

exercise. During the coding process, the code "unclear" was added to account for goals that may or may not have been specific to the writer. For example, one participant wrote, "I want to finish strong on all my assigments [sic] for this class." This goal could mean something quite specific to the writer (e.g., earning a grade of at least a B on all assignments or finishing all components of all assignments on time). However, it is also possible that the writer did not have a specific idea of what a strong finish entailed. Therefore, this goal was coded as unclear regarding specificity. The unclear code was also applied to goals that had elements that were specific as well as elements that were not specific (e.g., "Be easily passing Relay classes and do my best to stay focused and in the moment.").

After the initial round of yes, no, and unclear codes were applied to participant goals, another round of coding to ensure consistency across the first-order codes of yes, no, and unclear was applied. For example, use of the subcode "feeling," grouped under the unclear code, ensured that all goals referencing feelings were consistently coded as unclear. During this second round of coding, initial assessments (i.e., of yes, no, or unclear) were revised for consistency when applicable. All goals received a minimum of three reads during the coding process. Table 19 shows the subcodes for the specificity categories of yes, no, and unclear.

Table 19

Codes and Subcodes for Goal Specificity

Subcode	Definition	Example Participant Goals
		Specific: Yes
Performance	Goal was framed in terms of a desired performance outcome	• I wish to get an A on my Midterm 2 Assessment • my wish is to pass this class so I am able to graduate from relay.
Skill	Goal referred to the mastery or improvement of a skill	• Learn how to write my own lesson plan without guidence [sic] • I want to execute an effective read aloud with my new 1st grade students
Spend Time	Goal referred to spending time with a particular focus	• Spend time doing course work during the week instead of the weekend. • Get my grad work done right after school, so I can spend time with my family at night.
Task	Goal referred to the completion of a concrete task or two related concrete tasks	• Complete assignments due December 3rd prior to the deadlines, before December 1 if possible. This is when my mom is coming to visit for a week & to run the St. Jude's half marathon with me :) • Plan a schedule for pull-outs/ push-ins that I can stick to while still helping my mentee
		Specific: Unclear
Broad – Work	Goal referenced "work" without any additional specifics, or, additional specifics referred to multiple domains (e.g., school and classroom work)	• I want to have all work completed (for relay and school) 2 days before I need it/it is due • I wish I could get ahead on work.
Feeling	Goal referred to a feeling	• I wish I could feel more prepared when having to record a video for class. • To no longer feel like im [sic] playing 'catch-up' on grad school stuff
Hesitance	Participant expressed hesitance or uncertainty about the exact goal in writing	• possibly work AHEAD of the schedule • I want to start differentiating in some kind of way - making sure that I am complying with IEPs, of course, but also that I have work that can challenge my star students as well.

Subcode	Definition	Example Participant Goals
Multiple Unrelated	Multiple potentially unrelated tasks, goals, and/or skills were listed	• I wish I can get all my assignments done for Relay and credits for teach for America • To deliver all lessons that are given to me to present to kids, consistently while also keeping kids engaged.
Partial	A portion of the goal was specific, but another portion of the goal was vague	• I wish I could accomplish more before 5:30 on wednesdays [sic] so I could be more actively engaged in science content • Improve my grade on the midterm and feel like I tried my best.
Somewhat Broad	Goal pertained to a single domain or skill (e.g., school or planning), but was otherwise vague	• I want to be fully prepared for the week that follows. • Make better use of my planning time, so I can get my work done sooner.
	Specific: No	
Cross Domain	Goal clearly went beyond a singular focus	• Have an amazing next unit that will help my students better understanding content while also accommodating all Relay assignments, lessons, trackers, and my admin's expectations, and all the training days and class interruptions. • Gaining comprehensive understanding of this math class. Also, balancing my time with my studies, work, and home.
Broad	Goal was so broad that it likely encompassed multiple unrelated tasks, goals, and/or skills	• I want to find balance in my life so that I don't feel like I'm ignoring anything important in my life • Become a great teacher

After goals were coded for specificity, counts of each type of first order code (i.e., yes, unclear, or no) were compiled to determine whether specificity increased over time. Table 20 shows the results of this analysis. Overall, participant goals written as part of MCII exercises got more specific over time. However, goal specificity was higher in the initial goal setting activity, which happened prior to all MCII exercises, than in either the first or the second MCII exercises. Additionally, goal specificity in the initial goal setting exercise, the third MCII exercise, and the

fourth MCII exercise was similar; the range of goals coded as specific was 63% to 66% across these three points in time.

Table 20

Goal Specificity Over Time

Goal Specificity Code	Initial Goal Setting Exercise % (*n*)	MCII Round One % (*n*)	MCII Round Two % (*n*)	MCII Round Three % (*n*)	MCII Round Four % (*n*)
Yes	63% (*156*)	48% (*34*)	55% (*37*)	65% (*31*)	66% (*40*)
Unclear	31% (*77*)	15% (*11*)	18% (*12*)	13% (*6*)	13% (*8*)
No	6% (*16*)	37% (*26*)	27% (*18*)	23% (*11*)	21% (*13*)

Note. Total *N* counts are different at each point in time for two reasons. First, only written responses were coded (e.g., if a participant did not write a goal because they were absent, no code was applied for that participant during the given round). Second, the initial goal setting activity prompted participants to write three to six goals whereas the MCII exercises prompted participants to write a single goal.

Goal feasibility. Similar to the coding process for goal specificity, participant written goals were initially coded as yes or no relative to feasibility. During the coding process, the additional code unclear was again added. For feasibility, the code unclear was used when the goal was not specific (i.e., received a no for specificity), and therefore feasibility could not be determined. Because feasibility may vary from person to person, so long as goals were not coded as unclear relative to feasibility, the default feasibility assessment was yes. Because the directions for MCII exercises specified that goals should be achievable in four to six weeks, a code of no was only applied when a goal could not be achieved in this time. Similarly, the goal setting activity directions specified that goals should be achievable within six months. However, all goals written during this activity could be achieved within six months, so the no code was not used at all for the goal setting activity responses. Examples of goals coded yes for feasibility included: “Have my lesson materials prepared for the next 3 days at a time instead of just the next day,” and “Get my old student work organized.” Examples of goals coded “no” for

feasibility included “I wish to pass all of my teaching exams and gateways / get my masters degree,” and “To pass all needed praxis to get certified and to graduate with my masters,” both of which were written during an MCII exercise. Although these goals were likely feasible in the long term, they were not feasible within the two to four week period specified in the MCII directions.

Table 21 shows the percentage of goals coded as yes, unclear, and no for feasibility across time. Goal feasibility was higher than goal specificity regardless of timing. The time point with the lowest percentage of goals coded as yes for feasibility was MCII round two, during which 78% of goals were coded as feasible. In contrast, the time point with the highest percentage of goals coded as yes for specificity was MCII round four, during which 66% of goals were coded as specific. Goal feasibility was highest during the initial goal setting exercise (94% feasible), and lowest during MCII rounds one and two (79% and 78% feasible, respectively). Goal feasibility improved between rounds two and three, but did not reach the level of feasibility from the initial goal setting activity in either MCII round three or four. Therefore, although it cannot be concluded that goal feasibility improved over time, goal feasibility was strong (i.e., more than three quarters of participants wrote feasible goals) across time.

Table 21

Goal Feasibility Over Time

Goal Feasibility Code	Initial Goal Setting Exercise % (*n*)	MCII Round One % (*n*)	MCII Round Two % (*n*)	MCII Round Three % (*n*)	MCII Round Four % (*n*)
Yes	94% (*233*)	79% (*56*)	78% (*52*)	85% (*41*)	87% (*53*)
Unclear	6% (*77*)	17% (*12*)	18% (*12*)	13% (*6*)	13% (*8*)
No	0% (*0*)	4% (*3*)	4% (*3*)	2% (*1*)	0% (*0*)

Note. Total *N* counts are different at each point in time for the same reasons described with Table 20.

Goal desirability. Because only the person who writes a goal can assess whether it is desirable to them, goal desirability was measured as part of the post-intervention questionnaire rather than assessed based on participant writing. The post-intervention questionnaire (see Appendix I) included the item: "The wishes I picked during WOOP activities were meaningful and important to me." The item had a one to six response scale on which one corresponded to strongly disagree and six corresponded to strongly agree. Of the 48 participants in the treated group who completed the post-intervention survey, 71% agreed or strongly agreed with the item about meaningful goals (i.e., wishes in the WOOP activity), and 17% somewhat agreed. Therefore, the majority of participants found their goals to be desirable, with only six participants choosing responses on the disagree end of the scale.

Plans. The portion of research question one for the outcome evaluation that addresses plans focuses on the alignment between the participant's plan and the obstacle they identified that might stand in the way of goal achievement. To have an aligned plan, participants had to identify both an actionable obstacle (i.e., one within their locus of control) and a plan for overcoming this obstacle. Because the initial goal setting exercise did not include the identification of obstacles, participant plans for the goal setting exercise were not evaluated for alignment to obstacles. However, one prompt in the initial goal setting activity did ask participants to write strategies to achieve the goals that they wrote. For this prompt, which asked participants to write three to six different goals, participant goals included a plan 70% (n = 175) of the time and did not include a plan 30% (n = 74) of the time.

Because the MCII exercises included the both identification of obstacles and plans, more detailed coding was used with the MCII exercises than with the initial goal setting exercise. First, obstacles were coded relative to whether or not they were actionable, with possible codes once

again including yes, no, and unclear. Table 22 shows sample goals for each code as well as the percentage of goals that were actionable during each MCII exercise.

Table 22

Obstacle Examples and Coding Over Time

Obstacle Actionable Code	Example	MCII Round One % (*n*)	MCII Round Two % (*n*)	MCII Round Three % (*n*)	MCII Round Four % (*n*)
Yes	"I procrastinate and don't check canvas often enough to stay ahead of my work"	88% (*63*)	81% (*54*)	83% (*39*)	73% (*43*)
Unclear	"Scheduling"	8% (*6*)	9% (*6*)	11% (*5*)	20% (*12*)
No	"I don't have enough time in the day to grade, plan, do homework, coach volleyball, and practice selfcare"	4% (*3*)	10% (*7*)	6% (*3*)	7% (*4*)

Note. Total *N* counts are different at each point in time for the same reasons described with Table 20.

Overall, more than 80% of obstacles that participants identified were actionable regardless of the MCII round in which they were written with the exception of MCII round four, during which only 73% of obstacles were actionable. In the fourth round, more obstacles (20%) were coded as unclear relative to whether or not they were actionable compared to prior rounds. All obstacles with unclear codes in the fourth MCII round mentioned either volume of responsibilities (e.g., "too much to do") or time challenges (e.g., "Time!!!!!! Always"). Given this trend, the higher proportion of unclear obstacles in the fourth MCII round compared to other rounds might be explained by the time of year. The fourth round occurred near the end of the term, and graduate students were working toward final assessments in their courses as well as multiple end-of-term responsibilities for their own classrooms and students.

After obstacles were coded, participant plans were evaluated and coded for alignment to obstacles. As with the previously described coding processes for research question one, codes of

yes, no, and unclear were applied. When it came to plans, a yes code indicated the plan was one that could plausibly be used to overcome the identified obstacle, whereas a no code indicated the opposite (i.e., the plan did not align to the obstacle). The unclear code indicated that the plan may or may not align to the obstacle. As with goal specificity, subcodes were added after first-order codes of no and unclear to ensure consistency. Plans with a first-order code of yes did not require subcodes because they all demonstrated alignment to the written obstacles. Table 23 shows codes, subcodes, and examples of participants' written obstacles and plans for each type of code.

Table 23

Codes and Subcodes for Plan Alignment

Subcode	Definition	Example Participant Obstacles & Plans
	Plan Aligned: Yes	
N/A – subcodes not required for aligned plans	The plan would plausibly lead the participant to overcome the obstacle	• Obstacle: I procrastinate at making sure grading is graded once the assignment is once given. • Plan: When I am on my off period, then I will grade papers and make sure they are in the grade book.
	Plan Aligned: Unclear	
Partial	The plan would plausibly lead the participant to overcome part, but not all, of the obstacle	• Obstacle: My main obstacle is feeling tired and inadvertently using my time in ways I don't find productive/rewarding. Also scheduling too many events in one week. • Plan: When I have scheduled too many events in a week, then I will cancel/reschedule things in advance and learn to set better boundaries.
Indirect	The plan could lead the participant to overcome the obstacle, but the connection between the two is indirect or implied	• Obstacle: Worrying about the next day. • Plan: Right when I come home from school, then I will do what I need to get done for the next as soon as I get home from school. Stay after school and finish my work there.
Broad Obstacle	The obstacle as written was vague, and therefore the	• Obstacle: My schedule is very busy

Subcode	Definition	Example Participant Obstacles & Plans
	plan may or may not align to the obstacle	• Plan: When school ends on Thursday, then I will complete my missing work at the local Starbucks
Broad Plan	The plan as written was vague and therefore may or may not align to the obstacle	• Obstacle: Sometimes feeling discouraged, uncertain, being so tired that I just go to sleep instead of fully prepping and overall just overthinking • Plan: Start thinking and being more positive in general
	Plan Aligned: No	
Misaligned	The plan did not relate to the obstacle	• Obstacle: The main obstacle is making sure that I remember I need sleep! I fall a sleep while reading with the time towards the end of the day. • Plan: When I have time allotted for my work after my tight schedule, then I will be able to ensure growth quicker and add a better joy factor and excitement with different strategies.
No Solution	The participant expressed that they did not think there was a way to overcome the obstacle	• Obstacle: Getting my work done during the week • Plan: I currently do not have a plan at the moment. Part of my problem is my commute.
Obstacle Not Actionable	The obstacle identified was not one that the participant could control, and therefore the plan would not help them overcome the obstacle	• Obstacle: All the things I need to get done and not having enough time in the day. • Plan: When I feel drained, then I will remember to think about myself first.

As shown in Table 24, the extent of plan alignment tended to remain relatively stable across the MCII rounds, with the exception of round two. Although plan alignment ranged from 66% to 70% in MCII rounds one, three, and four, only 53% of plans were aligned to identified obstacles in MCII round two. During round two, a higher percentage of plans were evaluated as having unclear alignment compared to other rounds. Additionally, participants wrote aligned plans at a rate similar to which they wrote specific goals; depending on the MCII round, plan alignment ranged from 53% to 70% and goal specificity ranged from 48% to 66%. However,

these rates were lower than the rates at which participants wrote feasible goals (78% to 94% depending on the time) and lower than the percentage of participants who found their goals desirable (88%).

Table 24

Plan Alignment Over Time

Code for Plan Alignment to Obstacle	MCII Round One % (*n*)	MCII Round Two % (*n*)	MCII Round Three % (*n*)	MCII Round Four % (*n*)
Yes	66% (*46*)	53% (*30*)	66% (*27*)	70% (*35*)
Unclear	26% (*18*)	37% (*21*)	27% (*11*)	26% (*13*)
No	9% (*6*)	11% (*6*)	7% (*3*)	4% (*2*)

Note. Total *N* counts are different at each point in time for the same reasons described with Table 20. Also, fewer participants wrote plans as compared to goals during each MCII exercise. This was likely because the plan was the last step of the exercise, and facilitators and participants sometimes ran out of time during MCII exercises, as indicated by the process evaluation.

Types of goals and plans. During the qualitative analysis of goals and plans, it became evident that some participants were completing MCII exercises by choosing and planning from goals that were unrelated to their online coursework. Goals unrelated to online coursework could limit the effectiveness of the intervention because the intervention's intended outcomes all related specifically to online coursework. Therefore, beyond the coding done to answer research question one of the outcome evaluation, each goal was further coded as to whether it was entirely unrelated to online coursework or not. Goals coded as entirely unrelated to online coursework included: "I want to attend the gym for 1 hour at least 4 times a week," and "I want to enjoy my upcoming Thanksgiving vacation." During MCII rounds one, two, three, and four, 20%, 22%, 15%, and 11% of goals respectively were coded as entirely unrelated to online coursework. Although the proportion of goals that were unrelated to online coursework decreased over time, the unrelated goals and their associated plans should be considered when interpreting medium-

and long-term outcomes, and consequently are considered in the discussion section of this chapter.

Research question two. The second research question for the outcome evaluation focused on comparing participants in the treated and untreated groups on the intervention's intended medium- and long-term outcomes. The intervention's intended medium-term outcomes were improvement in time management skills, as measured by on-time assessment completion, and increased time management self-efficacy in the online environment. The intervention's intended long term outcomes were improved course completion rates and course grades in the online environment. Tables 25 to 28 compare the intended medium- and long-term outcomes of the intervention for participants in the treated and untreated groups.

Table 25

Intervention Participation and On-time Assessment Completion

	Minimum	Maximum	*M*	*SD*
Treated Group (*n* = 85)	0%	100%	66%	34%
Untreated Group (*n* = 63)	0%	100%	78%	31%

Note. Percent of assessments completed on time in online courses was used as a measure of time management skill.

Table 26

Intervention Participation and Time Management Self-Efficacy Change

	Minimum	Maximum	*M*	*SD*
Treated Group (*n* = 40)	-3.00	+2.40	-0.25	1.20
Untreated Group (*n* = 25)	-2.00	+1.80	+0.04	0.83

Note. Change in time management self-efficacy was measured by taking the difference between the post- and pre-intervention mean score on the time management subscale of Zimmerman and Kulikowich's (2016) online learning self-efficacy scale. The response options ranged from one to six, with one indicating low self-efficacy and six indicating high self-efficacy.

Table 27

Intervention Participation and Online Course Completion

	Participants who Completed All Online Courses Successfully % (*n*)	Participants who Did Not Complete All Online Courses Successfully % (*n*)
Treated Group (*n* = 89)	93.3% (*83*)	6.7% (*6*)
Untreated Group (*n* = 67)	92.5% (*62*)	7.5% (*5*)

Table 28

Intervention Participation and Grade in Online Courses

	Minimum	Maximum	*M*	*SD*
Treated Group (*n* = 86)	2%	100%	89%	12%
Untreated Group (*n* = 63)	45%	99%	90%	8%

Note. Grades are percents on a scale of one to 100. For participants who took more than one online course during the term, the grade used was an average weighted based on course credits.

Based on the descriptive statistics, participants in the intervention did not seem to perform better on medium- and long-term outcomes as compared to participants who did not receive the intervention. However, because the research design was quasi-experimental and participants were not randomly assigned to groups, descriptive statistics alone can be misleading. Therefore, the following sections describe the results of multiple regression analysis for the outcomes of time management skills, time management self-efficacy and online course grades. Multiple regression allows for the control of covariates, and therefore can lead to stronger conclusions than descriptive statistics or tests of differences in means. However, the use of multiple regression was not possible for course completion, given that course completion is a categorical variable, so course completion was further analyzed using a test of association, the results of which are also described in a section that follows.

Multiple regression approach. Before any multiple regression models were run, the bivariate correlations between all potential independent variables were assessed as a first check to ensure multicollinearity was not an issue. The largest correlation of -.424 existed between the dummy variable for race and ethnicity (i.e., whether or not the participant identified as an underrepresented person of color) and undergraduate GPA. Because the absolute values of all bivariate correlations were below .60, bivariate multicollinearity was not likely an issue for any of the regression models (Allison, 1999). However, multicollinearity can also occur between more than two variables. Therefore, the tolerance and inflation factor of every independent variable in every regression model was also checked. All tolerances were higher than .40 and all variance inflation factors were less than 2.50, once again indicating that multicollinearity was likely not an issue in any of the models (Allison, 1999).

After the initial multicollinearity check, either two or three different ordinary least squares multiple linear regression models were compared for each relevant dependent variable (i.e., on-time assessment completion, time management self-efficacy, and course grade) using a variable deletion approach to the selection of independent variables across each set of models. The first multiple regression model for each of the three dependent variables included all planned independent variables with the exception of instructor and campus. The inclusion of the instructor and campus variables would have necessitated the inclusion of 19 and 15 dummy variables respectively, thus weakening the overall models.

The second multiple regression models for both on-time assessment completion and course grade removed the independent variables associated with the pre- and post-intervention questionnaires because removal of questionnaire variables increased the sample size of the models. With the removal of questionnaire-based independent variables, sample sizes increased

from 64 to 148 and from 63 to 147 for the online course grade and on-time completion regression models, respectively. Removal of the questionnaire-based independent variables also made sense for the dependent variables of on-time assessment completion and course grade because separate linear regression models of these dependent variables, using only the questionnaire-based independent variables, were not significant.

The second multiple regression model for time management self-efficacy retained pre-intervention time management self-efficacy, a questionnaire variable, given the likely influence of pre-intervention self-efficacy on post-intervention self-efficacy. The sample size did not change with the deletion of other questionnaire variables because the pre-intervention self-efficacy measure kept the sample size limited. Therefore, only two models were evaluated for time management self-efficacy as the dependent variable, a model with all independent variables, and a model produced using stepwise backward deletion, described next.

Finally, following either the first (i.e., for time management self-efficacy) or second multiple regression model (i.e., for on-time assessment completion and course grade), stepwise backward deletion of independent variables was applied to create one additional model for each dependent variable. Stepwise backward deletion involved deleting the independent variable with the coefficient farthest from significance until only the independent variable for participation in the intervention, regardless of the significance of its coefficient, and independent variables with significant ($p < .05$) coefficients remained in the model. All multiple regression models for each dependent variable were considered in the interpretation of results to mitigate the weaknesses of each approach (i.e., low sample size in the first model, potential for inclusion of irrelevant independent variables in all but the last model, and potential for type I errors in the last model).

***On-time assessment completion*.** Regression models for on-time assessment completion used the percentage of assessments in online courses that were completed on time as the dependent variable as a proxy measurement of time management skills. Table 29 shows the three regression models for on-time assessment completion.

Table 29

Regressions for On-time Assessment Completion

	Model 1	Model 2	Model 3
Independent Variable	Coefficient (Significance)	Coefficient (Significance)	Coefficient (Significance)
Received intervention (yes = 1, no = 0)	-4.0 (.627)	-11.5 (.051)	-11.2 (.038*)
Undergraduate GPA	6.7 (.576)	15.1 (.053)	19.3 (.006**)
Gender (male = 1, female = 2)	-0.6 (.955)	-4.2 (.536)	
Race/ethnicity (underrepresented person of color = 1, other race or ethnicity = 0)	-18.2 (.046*)	-6.3 (.306)	
Age	-0.5 (.271)	-0.2 (.521)	
Year in graduate school	-7.9 (.395)	-3.3 (.569)	
Beginning of term time management self-efficacy for online learning	5.1 (.286)		
Use of non-intervention time management resources (yes = 1, no = 0)	12.7 (.134)		
Workload perception	2.9 (.572)		
N	63	147	148
R^2	.236	.098	.084
Adjusted R^2	.106	.059	.071
Model significance	.086	.024*	.002**

Note. Coefficients are unstandardized.
*$p < .05$; **$p < .01$

The first model, which included all independent variables, was not significant, and the only independent variable with a significant coefficient in the model was race/ethnicity. The race/ethnicity coefficient in this model indicates that participants who identified as an underrepresented person of color, on average, turned in assessments at a rate 18.2 percentage points lower than other students, when all other variables in the model were controlled. However, the model as a whole was not significant, and the race/ethnicity independent variable did not remain significant when sample size increased from model one to model two.

The second model, which removed the questionnaire variables, was significant, although it explained less of the variance in on-time assessment completion than the first model. None of the coefficients in this model were significant. However, the coefficients for both the intervention dummy variable and undergraduate GPA were close to significance at the .05 level, with p-values of .051 and .053 respectively. The third model was also significant, as were the coefficients of the two independent variables in this model, the intervention dummy variable and undergraduate GPA. Backward deletion, the process used to arrive at model three, can lead to type I errors (Allison, 1999). However, given that the coefficient for the intervention dummy variable was negative in all three models for on-time assessment completion, was close to significance in model two, and was significant in model three, it is possible that the intervention decreased participants' time management skills.

Time management self-efficacy. Regression models for time management self-efficacy used the post-intervention mean time management self-efficacy score (Zimmerman & Kulikowich, 2016) as the dependent variable. Individual items from the time management subscale of Zimmerman and Kulikowich's (2016) measure of self-efficacy for online learning can be seen in Appendix A. Response options for time management self-efficacy items ranged

from one to six, with one indicating low self-efficacy and six indicating high self-efficacy. Cronbach's alpha for the time management subscale, which was included in both the pre- and post-intervention questionnaires, indicated the subscale was reliable, with values of .81 and .92 respectively. Table 30 shows the three regression models for time management self-efficacy in the online learning environment.

Table 30

Regressions for Post-Intervention Time Management Self-Efficacy

	Model 1	Model 2
Independent Variable	Coefficient (Significance)	Coefficient (Significance)
Received intervention (yes = 1, no = 0)	-0.4 (.193)	-0.4 (.084)
Undergraduate GPA	0.3 (.393)	
Gender (male = 1, female = 2)	0.2 (.497)	
Race/ethnicity (underrepresented person of color = 1, other race or ethnicity = 0)	-0.3 (.305)	
Age	0.0 (.720)	
Year in graduate school	0.1 (.825)	
Beginning of term time management self-efficacy for online learning	0.6 (.000**)	0.7 (.000**)
Use of non-intervention time management resources (yes = 1, no = 0)	0.5 (.104)	
Workload perception	0.5 (.005**)	0.4 (.003**)
N	64	65
R^2	.415	.343
Adjusted R^2	.317	.311
Model significance	.000**	.000**

Note. Coefficients are unstandardized.
*$p < .05$; **$p < .01$

Both regression models for post-intervention time management self-efficacy were significant. In each model, beginning of term time management self-efficacy and perception of workload, which were both variables measured via questionnaire, were the only independent variables with significant coefficients. The positive coefficients on these variables indicate that higher beginning-of-term time management self-efficacy predicted higher end-of-term time management self-efficacy, as did higher perceptions of the extent to which workload was manageable. The coefficient for the intervention dummy variable was not significant in either model, indicating that the intervention may not have influenced time management self-efficacy.

***Online course completion*.** Multiple regression was not possible with online course completion as the dependent variable because course completion is a categorical variable; participants either completed all their online courses successfully (i.e., with a grade of 70% or higher) or did not (i.e., earned a grade lower than 70%, withdrew, or received an incomplete). Therefore, a chi-squared test of association was run to compare the two categorical variables of interest: participation in the intervention and online course completion. However, one of the cells in the chi-squared test (i.e., 25% of the four cells) had an expected value below five, indicating Fisher's exact test should be interpreted instead. Fisher's exact test did not reveal a significant association between the intervention and course completion, $p > .999$.

***Online course grades*.** Regression models for online course grade included grades out of 100 percentage points as the dependent variable. In cases where a participant took more than one online course during the term of the intervention, the grade used in the regression model was the weighted average, by number of course credits, of all online courses. In all cases in which a participant took multiple online courses, their courses were all taught by the same instructor, who

was also the one who ran the intervention or had their class designated to be part of the untreated group. Table 31 shows the three regression models for course grade.

Table 31

Regressions for Course Grade

	Model 1	Model 2	Model 3
Independent Variable	Coefficient (Significance)	Coefficient (Significance)	Coefficient (Significance)
Received intervention (yes = 1, no = 0)	0.7 (.643)	1.4 (.420)	0.9 (.600)
Undergraduate GPA	1.3 (.550)	3.8 (.111)	
Gender (male = 1, female = 2)	-0.1 (.961)	-1.2 (.549)	
Race/ethnicity (underrepresented person of color = 1, other race or ethnicity = 0)	-5.4 (.002**)	-6.4 (.001**)	-7.0 (.000**)
Age	0.0 (.929)	0.2 (.115)	
Year in graduate school	-2.1 (.227)	1.9 (.296)	
Beginning of term time management self-efficacy for online learning	0.0 (.997)		
Use of non-intervention time management resources (yes = 1, no = 0)	-0.1 (.949)		
Workload perception	-0.4 (.634)		
N	64	148	149
R^2	.293	.152	.109
Adjusted R^2	.175	.116	.097
Model significance	.019*	.001**	.000**

Note. Coefficients are unstandardized.
*$p < .05$; **$p < .01$

All three regression models for course grade were significant. However, the only variable with a significant coefficient in any model was race/ethnicity. This variable was significant in

every model. The coefficients for race/ethnicity varied from -5.4 to -7.0, indicating that, on average and when controlling for other variables in each model, students identifying as underrepresented people of color received grades between 5.4 and 7.0 percentage points lower than other students in online courses. The intervention variable was not significant in any model, and coefficients for this variable were low (i.e., less than 1.5 percentage points) in every model. Therefore, as with online time management self-efficacy and course completion, the intervention may have had no effect on participant grades in their online courses.

Instructors with both treated and untreated class sections. Three instructors taught one class that received the intervention and one class that did not. In each of these cases, students were registered in one class section or the other; there was no cross-contamination. Because none of the regression models controlled for instructor, data for just the participants in these instructors' classes were compared, which restricted the sample size to 38. Based on the smaller sample, difference in means tests were used to compare outcomes between the treated and untreated groups in terms of on-time completion of assessments, change in time management self-efficacy from pre- to post-intervention questionnaire, and course grade. Specifically, a Mann-Whitney U test was used in each case because at least one group in each comparison had a non-normal distribution of data for the variable of interest (e.g., change in self-efficacy for the untreated group). All tests indicated no significant differences between the groups receiving and not receiving the intervention on any of the three dependent variables tested (i.e., on-time completion of assessments, change in time management self-efficacy, and course grade). Additionally, all students in both the groups receiving and not receiving the intervention in this subset of participants completed their online courses successfully. Therefore, there was no

association between the intervention and successful course completion among this subset of students.

***Dose comparisons*.** As noted in the process evaluation, one fidelity of implementation issue had to do with dose of MCII exercises. Specifically, 26% (n = 23) of participants who were in the treated group were present for two or fewer MCII exercises. To determine if inadequate dose may have influenced results, students within the treated group who were present for three or four MCII exercises were compared to those who were present for two or fewer MCII exercises.

Difference in means tests were used to compare on-time assessment submission, change in time management self-efficacy, and course grade for students present for at least three MCII exercises and students present for two or fewer exercises. The Mann-Whitney U test was used for on-time assessment submission and change in time management self-efficacy because data distributions were not normal for at least one group in each comparison. A t test was used for change in time management self-efficacy. Although participants who were present for three or more MCII activities submitted assignments on time at a higher rate (M = 68%, SD = 32%) than those who were present less frequently (M = 58%, SD = 41%), this difference was not significant, U = 570, p = .389. In contrast, students who received a lower dose has a smaller decrease in time management self-efficacy across the term (M = -0.1, SD = 1.6) compared to those with a higher dose (M = -0.3, SD = 1.1), but again the difference was not significant, $t(38) = 0.52$, p = .605. There was, however, a significant difference in course grades between students who received a higher dose (M = 91%, 8%) and those who received a lower dose (M = 84%, SD = 19%), U = 376, p = .002. Additionally, Fisher's exact test indicated that there was a significant association (p = .037) between dose and successful course completion. Among participants in the treated group who were present for at least three MCII exercises, 3% did not

successfully complete their online courses in the term. Among those who were present for two or fewer MCII exercises, 7% did not successfully complete their online courses in the term.

Both significant findings (i.e., for grades and successful course completion) indicated that those who received at least three of the four planned MCII activities outperformed those who received fewer MCII exercises. Therefore, the intervention may have had more positive results if all participants received either three or four rounds of the MCII exercises. It is also possible that students who attended class less frequently were more likely to fail to complete courses or to earn lower grades for reasons unrelated to the intervention. However, 15 of the 23 participants who were in the treated group but received two or fewer MCII exercises were in a class taught by an instructor who did not implement all four MCII activities. For these participants, individual attendance was not necessarily the issue because dose was reduced due to instructor actions.

Research question three. Research question three focuses on how the intervention's intended medium- and long-term outcomes varied for students with low (i.e., < 3.00) and higher (i.e., ≥ 3.00) undergraduate GPAs. Because only 29 participants had undergraduate GPAs below 3.00, difference in means tests were used to compare outcomes on variables for which multiple regression was used for research question one due to the reduced sample size. Tables 32 to 35 show descriptive statistics comparing outcomes for students in treated and untreated groups according to undergraduate GPA.

Table 32

Intervention Participation and On-time Assessment Completion by Undergrad GPA

	Undergrad GPA < 3.00				Undergrad GPA ≥ 3.00			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Treated Group	0%	100%	60%	30%	0%	100%	67%	35%
Untreated Group	0%	100%	55%	37%	0%	100%	82%	27%

Note. Percent of assessments completed on time in online courses was used as a measure of time management skill.

Table 33

Intervention Participation and Time Management Self-Efficacy Change by Undergrad GPA

	Undergrad GPA < 3.00				Undergrad GPA ≥ 3.00			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Treated Group	-1.6	+0.6	-0.6	0.7	-3.0	+2.4	-0.2	1.3
Untreated Group	-2.0	+0.4	-0.7	1.2	-1.6	+1.8	+0.1	0.7

Note. Change in time management self-efficacy was measured by taking the difference between the post-intervention and pre-intervention mean score on the time management subscale of Zimmerman and Kulikowich's (2016) online learning self-efficacy scale. The response options ranged from one to six, with one indicating low self-efficacy and six indicating high self-efficacy.

Table 34

Intervention Participation and Online Course Completion by Undergrad GPA

	Undergrad GPA < 3.00		Undergrad GPA ≥ 3.00	
	Participants who Completed All Online Courses Successfully % (*n*)	Participants who Did Not Complete All Online Courses Successfully % (*n*)	Participants who Completed All Online Courses Successfully % (*n*)	Participants who Did Not Complete All Online Courses Successfully % (*n*)
Treated Group	94% (*16*)	6% (*1*)	94% (*67*)	6% (*4*)
Untreated Group	75% (*9*)	25% (*3*)	96% (*53*)	4% (*2*)

Table 35

Intervention Participation and Grade in Online Courses by Undergrad GPA

	Undergrad GPA < 3.00				Undergrad GPA ≥ 3.00			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Treated Group	73%	95%	87%	6%	2%	100%	90%	13%
Untreated Group	45%	94%	83%	14%	72%	99%	91%	6%

Note. Grades are percents on a scale of one to 100. For participants who took more than one online course during the term, the grade used was an average weighted based on course credits.

As shown by tables 32 to 35, for all four medium- and long-term outcomes, participants who received the intervention outperformed those who did not receive the intervention among students with undergraduate GPAs under 3.00. The same was not true for students with undergraduate GPAs of 3.00 or higher (i.e., among the higher GPA subgroup, participants in the untreated group performed better on measured outcomes than participants in the treated group), indicating the intervention may have had a differentially positive influence on students in the low GPA subgroup. To test if any differences between the treated and untreated groups were significant among students with low GPAs, Mann-Whitney U tests were performed for on-time assessment completion, change in time management self-efficacy, and course grade. The Mann-Whitney U test was used in each case because the distribution of data for at least one group in each comparison was not normal. Differences between the intervention and non-intervention groups among students with low GPAs were not significant for course grade ($U = 69$, $p = .422$), on-time assessment completion ($U = 72$, $p = .662$), or change in time management self-efficacy ($U = 12$, $p = .918$).

For successful completion of online courses, a chi-squared test could not be used to determine if there was an association between the intervention and course completion among students with GPAs below 3.00 because two cells (i.e., 50%) in the comparison matrix had expected values below five. However, a Fisher's exact test was not significant ($p = .279$), indicating that participation in the intervention was not associated with course completion. Therefore, as with the other three dependent variables associated with the intervention's intended medium- and long-term outcomes, although descriptive statistics indicated the intervention might have been associated with stronger outcomes for students with low GPAs, the association was not significant. However, the lack of significance in both the Mann-Whitney U tests and the

Fisher's exact test may have been due to the small sample size for students with low GPAs (n = 29).

For students with higher (i.e., ≥ 3.00) undergraduate GPAs, the same tests (i.e., Mann-Whitney U for difference in means and Fisher's exact test for association with course completion) were also used to determine if any differences between students in treated and untreated groups were significant. The only significant difference was for on-time assessment completion (U = 1388, p = .012). This finding corresponds with the significant negative coefficient for on-time assessment completion in the third regression model for this variable (see Table 29).

Research question four. Research question four focuses on how the intervention's intended medium- and long-term outcomes compared for male and female students. Tables 36 to 39 show descriptive statistics comparing outcomes for students in treated and untreated groups according to gender.

Table 36

Intervention Participation and On-time Assessment Completion by Gender

	Male Students				Female Students			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Treated Group	0%	100%	61%	37%	0%	100%	66%	34%
Untreated Group	0%	100%	72%	35%	0%	100%	80%	29%

Note. Percent of assessments completed on time in online courses was used as a measure of time management skill.

Table 37

Intervention Participation and Time Management Self-Efficacy Change by Gender

	Male Students				Female Students			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Treated Group	-1.0	+0.4	-0.4	0.6	-3.0	+2.4	-0.2	1.3
Untreated Group	-0.2	+1.0	+0.5	0.4	-2.0	+1.8	-0.1	0.9

Note. Change in time management self-efficacy was measured by taking the difference between the post-intervention and pre-intervention mean score on the time management subscale of Zimmerman and Kulikowich's (2016) online learning self-efficacy scale. The response options ranged from one to six, with one indicating low self-efficacy and six indicating high self-efficacy.

Table 38

Intervention Participation and Online Course Completion by Gender

	Male Students		Female Students	
	Participants who Completed All Online Courses Successfully % (*n*)	Participants who Did Not Complete All Online Courses Successfully % (*n*)	Participants who Completed All Online Courses Successfully % (*n*)	Participants who Did Not Complete All Online Courses Successfully % (*n*)
Treated Group	93% (*13*)	7% (*1*)	93% (*70*)	7% (*5*)
Untreated Group	94% (*17*)	6% (*1*)	92% (*44*)	8% (*4*)

Table 39

Intervention Participation and Grade in Online Courses by Undergrad GPA

	Male Students				Female Students			
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*
Treated Group	73%	99%	89%	7%	2%	100%	89%	13%
Untreated Group	45%	97%	87%	12%	72%	99%	90%	6%

Note. Grades are percents on a scale of one to 100. For participants who took more than one online course during the term, the grade used was an average weighted based on course credits.

Unlike the comparisons between students with low and high undergraduate GPAs, analysis of descriptive statistics did not suggest clearly different trends by gender. For both males and females, participants in the untreated group outperformed participants in the treated group in change in self-efficacy and on-time submission of assessments. For course completion, male students in the treated group completed courses at a lower rate than those in untreated group, and the pattern was reversed for female students. For course grades, female students in the treated group had higher average course grades than those in the untreated group, and the pattern was reversed for male students.

To determine if any differences were significant, difference in means tests were used to compare treated and untreated groups for change in time management self-efficacy, on-time assessment completion, and course grade. The Mann-Whitney U test was chosen for all but one comparison because the data for at least one group in most comparisons had a distribution that was not normal. For the one exception, change in time management self-efficacy for female students, a *t* test was used. Among male students, differences in on-time assessment completion and course grades between participants receiving and not receiving the intervention were not significant. However, there was a significant difference in change in time management self-efficacy, $U = 2.5$, $p = .037$. Self-efficacy decreased on average ($M = -0.4$, $SD = 0.6$) for male students in the treated group, but increased ($M = +0.5$, $SD = 0.4$) for those in the untreated group.

Among female students, the differences in change in time management self-efficacy ($t(52) = 0.40$, $p = .690$) and course grade ($U = 1592$, $p = .937$) between participants in the treated and untreated groups were not significant. In contrast, the difference in on-time assessment completion between female students receiving and not receiving the intervention was significant,

$U = 1233$, $p = .033$. Female students who received the intervention had a mean on-time submission rate of 66% ($SD = 34\%$), compared to 80% ($SD = 29\%$) among those who did not receive the intervention. The significant difference between female students in the treated and untreated groups in on-time submission of assignments corresponds to the significant negative coefficient for the intervention in the third regression model for on-time assessment completion (see Table 29). These similar findings make sense because most student participants (i.e., 123 out of 156) identified as female. Similarly, most participants had undergraduate GPAs of 3.00 or higher ($n = 126$). As described in the previous section, a Mann-Whitney U test for this subgroup also indicated a significant difference between the treated and untreated groups, with those receiving the intervention having a lower rate of on-time submission. Finally, the lack of significance in the difference between on-time assessment completion among male students ($n = 32$) and among students with low GPAs ($n = 29$) in intervention and non-intervention groups may have been due to the comparatively low number of participants in each of these subgroups (i.e., male students and students with low GPAs as compared to female students and students with higher GPAs).

For the categorical outcome (i.e., course completion), chi-squared tests were initially run to determine if there was an association between the intervention and successful online course completion among male and among female students. As with previous chi-squared tests, expected values below five in test cells for both the male and female subgroups indicated that Fisher's exact test should be used instead. The Fisher's exact test indicated no significant association between the intervention and successful course completion among both male ($p > .999$) and female ($p = .735$) students.

Summary of Findings

Overall, the outcome evaluation surfaced no significant positive findings associated with the intervention relative to on-time assessment completion, change in time management self-efficacy, successful course completion, or course grades in the online environment. In fact, participation in the intervention may have been predictive of reduced rates of on-time assessment completion. However, descriptive statistics indicated that students with low undergraduate GPAs participating in the intervention outperformed those in the same subgroup not receiving the intervention. None of these differences was significant, and a causal positive impact of the intervention cannot be inferred for students with low GPAs, but the trend warrants further attention, as described in the discussion section, next.

The outcome evaluation also indicated that although participants tended to write feasible goals (i.e., 78% to 94% of the time) and identify actionable obstacles that might stand in the way of goal attainment (i.e., 73% to 88% of the time), their goals were less frequently specific (i.e., 48% to 66% of the time) and were unrelated to online coursework between 11% and 22% of the time. Participants who wrote goals that were not specific or not related to online coursework may have contributed to the lack of positive results associated with the intervention. Findings from the process evaluation may also have related to the findings of the outcome evaluation. First, although the implementation of the intervention had strengths across all five dimensions of fidelity (i.e., adherence, dose, quality of delivery, participant responsiveness, and program differentiation; Dusenbury et al.2003), dose was an issue for the approximately one quarter of participants in the treated group who received two or fewer of the four planned MCII exercises. Additionally, a subset of both facilitators and participants reported feelings of insufficient time

associated with the intervention. Connection between the process and outcome evaluation findings will be further explored in the discussion section, next.

Discussion

Process Evaluation

Table 40 provides an overview of the strengths of the intervention's fidelity of implementation as well as deviations from the plan for the intervention, according to the process evaluation research questions and the dimensions of fidelity of implementation. Synthesizing key fidelity findings in such a table is useful because the table acts as a joint display, which merges qualitative and quantitative findings and is an effective method of interpreting the results of mixed methods studies (Creswell & Plano-Clark, 2011).

Table 40

Fidelity of Implementation Synthesis

Fidelity Dimension	Implementation Strengths	Implementation Deviations
Research Question 1: To what extent did the actual intervention match the intervention as planned?		
Adherence	Goal setting activity: • Added to each online course taught by an instructor implementing the intervention MCII exercises: • Exercises implemented 48 out of the 52 planned times • When facilitating MCII exercises, instructors included all steps 100% of the time, based on both surveys and observations, and gave participants time to write down key words for each step 97% of the time based on surveys and 100% of the time in observations	MCII exercises: • One online class section only received two of the four planned MCII exercises • Two online class sections only received three of the four planned MCII exercises • Instructors did not always ask participants to revisit the goal setting activity before an MCII exercise; one out of six instructors observed skipped this step, and survey data indicated that this step was skipped 16% of the time

Fidelity Dimension	Implementation Strengths	Implementation Deviations
Quality of Delivery	Goal setting Activity: • Asynchronous; precise wording matching the theory of treatment used in all cases MCII exercises: • All six facilitators observed framed the exercise in terms of the achievement of goals, and five of the six facilitated using either an audio recording or a verbal script, both of which were precisely worded to match the theory of treatment • Facilitators tended to add logistical directions to help participants focus on the MCII exercise	MCII exercises: • Two of the six facilitators observed did not remind participants to choose a wish related to online coursework • In two of the six observations, a facilitator gave a direction that did not fully support quality of delivery; however, in both cases the issue only arose in a single step of the MCII protocol (e.g., in the "outcome" step of the wish, outcome, obstacle, plan format) • In two of the six observations, a facilitator moved on before participants appeared to have completed a portion of the activity; however, in both cases, the issue only arose in the planning step of the MCII protocol • Facilitators cited timing, specifically not having enough time, as an implementation issue in 18% of surveys
Research Question 2: How much of the intervention did participants engage in?		
Dose	Goal setting activity: • 93% of participants completed the full goal setting activity MCII exercises: • On average, participants were present for 3.2 out of the four planned MCII exercises; the goal established in the planning stages of the intervention was that participants would be present, on average, for at least three of the four planned exercises	Goal setting activity: • 2% of participants only partially completed the goal setting activity and 4% did not complete any of it MCII exercises: • 26% of participants were present for two or fewer MCII exercises out of the four that were planned
Participant Responsiveness	Goal setting activity: • 79% of participants at least somewhat agreed that they felt engaged in the goal setting activity	Goal setting activity: • 21% of participants at least somewhat disagreed that they felt engaged in the goal setting activity

Fidelity Dimension	Implementation Strengths	Implementation Deviations
	MCII exercises: • 88% of participants at least somewhat agreed that they felt engaged in the MCII exercises and 73% at least somewhat agreed that they found revisiting the goal setting activity before each MCII exercise to be useful Overall: • Most (40 of 48 who completed the questionnaire) participants cited one or more ways in which the intervention was useful; participants most commonly liked setting a goal or a wish, creating a plan to achieve the goal or wish, identifying an obstacle that could get in the way of goal or wish attainment, being able to reflect as part of the intervention process, and having specific time allocated for intervention activities • 40% of participants indicated that there was nothing "least useful" about the intervention	MCII exercises: • 13% of participants at least somewhat disagreed that they felt engaged in the MCII exercises and 27% at least somewhat disagreed that they found revisiting the goal setting activity before each MCII exercise to be useful Overall: • Three participants noted that nothing was useful about the intervention, and two of these three also indicated that all parts of the intervention were NOT useful • The most commonly cited issues with the intervention included not feeling a sense of accountability and not having enough time for intervention activities
Research Question 3: How did participants in treated and untreated groups compare in terms of use of non-intervention time management resources and perceptions of job, personal, and school workloads?		
Context	• Differences between treated and untreated groups were small in terms of the use of time management resources outside of the intervention and perception of workload associated with personal and job-related responsibilities • Participants in both the treated and untreated groups cited calendars and planners as commonly used time management resources outside of the intervention	• Participants in the treated group used time management resources outside of the intervention somewhat more frequently than those in the untreated group (39.6% compared to 34.5%), although the difference was not significant • Participants in the treated group perceived their workload associated with graduate school as more manageable than those in the untreated group, although the difference between the aggregate measurement of workload perception between the treated and untreated groups was not significant

Given that the intervention was not implemented in a laboratory setting, fidelity was strong in that it included strengths across all dimensions, as shown in Table 40. However, limitations in the fidelity of implementation must be taken into account when interpreting outcomes. One key limitation that may have influenced the intervention's outcomes was the dose of the MCII exercises. Specifically, 26% (n = 23) of participants did not receive at least three of the four planned MCII exercises (i.e., an issue with dose), 15 of whom were in one of the three class sections in which the instructor did not implement all four MCII exercises. This issue may have influenced the observed outcomes of the intervention because participants who received two or fewer MCII activities had significantly lower grades than those who received three or more MCII exercises. Additionally, there was a significant association between dose and course completion, with those students receiving two or fewer MCII exercises failing to complete online courses at higher rates than those who received a higher dose. In contrast, the goal setting activity demonstrated complete adherence given its asynchronous nature, and 93% of participants completed the full goal setting activity (i.e., a strength related to dose).

Another limitation that may have influenced the intervention's outcomes relates to a timing issue that was identified across multiple measures and dimensions of fidelity. Specifically, facilitators moved on before participants had completed a portion of the MCII exercises in two out of six observations, and facilitator surveys indicated that not having enough time for the intervention was the most common implementation issue. Participant surveys indicated that insufficient time was the second most common issue after lack of a sense of accountability, and more participants completed the first than the last step of the MCII exercise during each round. Although the majority of observations and surveys did not indicate time as an

issue, and the majority of participants who started each MCII activity also finished it, the trend still warrants attention because a portion of both facilitators and participants did not have enough time to complete intervention activities. Insufficient time may have in turn moderated the effectiveness of the intervention for the subset of participants who indicated it was an issue or did not finish the MCII exercises.

The deviations noted in Table 40 other than those related to the dose and timing of MCII activities are important to note, but less concerning because they were generally less pervasive (i.e., as compared to the timing issue) and severe (i.e., as compared to the dose issue). For example, the directions deviations related to quality of delivery that came up in two observations pertained only to a single step of the MCII exercise, meaning most of the exercise was implemented with a high degree of quality of delivery in both cases. Similarly, the contextual differences noted between the treated and untreated groups were generally not large. In contrast, some potentially larger issues were identified within the participant responsiveness dimension of fidelity. For example, 21% of participants who competed the post-intervention survey indicated that they did not feel engaged in the goal setting activity, and 6% noted that they found nothing useful about the intervention. However, the effectiveness of the intervention, based on its theory of treatment, is more dependent on other aspects of fidelity, like dose and adherence, than on participant responsiveness. That said, these responses are worth keeping in mind for improving the intervention, should it be implemented again in the future.

Outcome Evaluation

In contrast to previous research on a goal setting activity similar to the one used in this study (Morisano et al., 2010; Schippers et al., 2015) and on MCII exercises (Kizilcec & Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2017), the intervention in this study did not

yield conclusively positive outcomes. The intervention may also have negatively related to at least one measured outcome, on-time assessment completion. In contrast, descriptive statistics indicated the intervention might be useful for students with low GPAs, in particular. The following sections discuss the findings relative to the intended short-, medium-, and long-term outcomes of the intervention and the possible explanations for and implications of these findings.

Research question one. Short-term outcomes, assessed by research question one in the outcome evaluation, related to the quality of participants' goals and plans. Important characteristics of participant goals included specificity, feasibility, and desirability. Important characteristics of participant plans included the identification of actionable obstacles and alignment of plans to these obstacles. When participants wrote goals and plans, they were engaging in the forethought phase of Zimmerman's (2002) self-regulated learning cycle, which supports performance (e.g., enacting strategies to achieve goals) in the next stage of the cycle. Therefore, the quality of participant goals and plans likely related to participants' performance on the medium- and long-term outcomes of on-time assessment completion, successful course completion, and course grades. Participant goals and plans both demonstrated strengths and weaknesses relative to quality.

Goals. During the initial goal setting activity, almost all (94%) goals written were feasible, whereas just under two thirds (66%) were specific. Similar outcomes were found across MCII exercises in this study. More than three quarters of goals written in each MCII round were feasible, reaching a maximum of 87% of goals being feasible in the last MCII round. In the study on mental contrasting (i.e., the MC portion of MCII) conducted by Kappes et al. (2012), participants who set goals that they expected to achieve (i.e., feasible goals) strengthened mental associations between their identified obstacles and their plans to overcome them, but this was not

true for participants with unfeasible goals. Consequently, for participants in MCII, feasible goals might reduce the mental strain required to implement planned actions when obstacles arise (Kappes et al., 2012). The feasible goals written by participants in this study, therefore, may have helped participants strengthen the mental connections between their obstacles and plans and subsequently helped them overcome obstacles as they worked toward goal attainment.

In contrast to goal feasibility, goal specificity was weaker, ranging from a minimum of 48% during the first MCII exercise to a maximum of 66% during the fourth MCII exercise. Despite the increase in specificity over time, the proportion of participant goals that were specific stayed at or below two thirds at all points in time. Furthermore, a high proportion of goals were not specific (i.e., as opposed to simply unclear relative to specificity) during each MCII round, with non-specific goals ranging from a minimum of 21% in MCII round four to a maximum of 37% in MCII round one. Specific goals are important to the intervention's theory of treatment because mental contrasting requires detailed imagination of desired goals (Oettingen, 2012). Therefore, participants in this study who did not set specific goals may have been less likely to achieve associated positive outcomes such as improved time management self-efficacy or skills.

The last important quality of goals that was evaluated as part of research question one was desirability. As with specificity and feasibility, goals should be desirable to participants for MCII exercises to be effective (Oettingen, 2012). On the post-intervention questionnaire, 88% of participants at least somewhat agreed that their goals were meaningful and important to them, indicating that participants tended to pick desirable goals. Therefore, goal feasibility and desirability likely supported the effectiveness of the intervention, whereas goal specificity may

have limited the effectiveness of the intervention for the proportion of participants who did not write specific goals.

Analysis of the process evaluation helps to explain the strengths and weaknesses of participants' goals, thus also highlighting the importance of the process evaluation itself. The process evaluations demonstrated that intervention facilitators tended to follow protocols for giving MCII directions; five of six observations indicated that facilitators followed a script or played a scripted audio recording, for example. The scripted and audio directions included prompts such as, "Write a wish that is important to you. The wish should be difficult but achievable" (Character Lab, 2018). Such directions directly supported goal feasibility and desirability. The audio directions (Oettingen, 2014) also prompted participants to pick a single wish, choosing the one that was most important to them if they had several that they were thinking about, thus supporting specificity. However, this language was not explicitly included in the written script, which may have contributed to the lower rates of goal specificity as compared to feasibility and desirability.

Additionally, the process evaluation also revealed that on the post-intervention survey, 27% of participants indicated that they did not find revisiting the initial goal setting activity to be useful prior to engaging in MCII. The initial goal setting activity prompted participants to write three to six different goals, including personal goals unrelated to online coursework. Participants may have therefore felt confused about the connection between the initial goal setting activity and the individual MCII exercises, which focused on shorter-term goals related to coursework. Revisiting the goal setting activity may have also prompted some participants to write non-specific goals that crossed multiple domains (e.g., "Better time management and work/life balance"). Similarly, revisiting the goal setting activity may have contributed to the 11% to 22%

of participant goals, depending on the MCII round, that were completely unrelated to online coursework. Furthermore, previous studies demonstrating the effectiveness of MCII (Kizilcec & Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2017) did not include participants making connections between MCII exercises and other activities (e.g., a broader goal setting activity). Consequently, those considering implementing MCII exercises in the future should ensure directions about goal specificity are included and consider having MCII exercises stand alone rather than tying them to another component of an intervention.

Plans. Within MCII exercises, participant plans tended to include actionable obstacles. Obstacles were coded as actionable between 73% and 88% of the time depending on the MCII round. However, plans were only aligned to obstacles 53% to 70% of the time depending on the MCII round. As with the writing of feasible and desirable goals, instructor directions, which were explored through the process evaluation, may have supported the writing of actionable obstacles. For example, the facilitation script included the prompt, "What is an internal obstacle? This must be something that you have control over" (Character Lab, 2019). The audio directions similarly included the prompt, "What behavior of yours, or emotion, could hinder you from fulfilling your wish…what is it in you that stops you from realizing your wish" (Oettingen, 2014). In contrast, the facilitation script could have provided stronger guidance for obstacle alignment. The audio directions did include directions that explicitly prompted participants to relate plans to obstacles (i.e., "what would be an effective action you can take in order to overcome or circumvent the obstacle"; Oettingen, 2014), as did the written directions (see Appendix K). However, the verbal facilitation script for the planning portion of the MCII exercise did not include such explicit directions.

Beyond the directions given by the facilitator, a limitation surfaced in the process evaluation, timing, may also have related to lack of alignment in plans. Multiple facilitators and student participants noted in questionnaire responses that they did not feel they had enough time to complete the MCII exercises. As a result, participants may have rushed through the planning step of the MCII in particular (i.e., as compared to the other steps) because it was the last step of the exercise. Process evaluation data from observations of MCII implementation also support the conclusion that insufficient time may have been a limitation in the planning step of MCII, in particular. When observational notes were coded, the code used to indicate insufficient time was applied to two out of six observations of MCII exercises. In both cases, the code was applied only to the planning step of the MCII exercise. Additionally, during every MCII exercise, more participants wrote goals than wrote plans, indicating that not only did participants struggle with alignment of plans, some wrote no plans at all.

The implementation intentions (i.e., the "II") portion of MCII exercises may work by giving participants' a mentally accessible plan to enact when obstacles arise (Adriaanse et al., 2011). Therefore, participants in this study who did not get to the planning stage due to time issues or wrote a plan that did not align to their identified obstacle may have been less likely to benefit from the MCII exercises than those who wrote plans aligned to actionable obstacles. Timing was not cited as an issue in other studies of MCII (e.g., Adriaanse et al., 2011), which may help explain why the MCII exercises in this study did not lead to comparably positive results as those found by Kizilcec and Cohen (2017), Oettingen et al. (2015), or Saddawi-Konefka et al. (2017). Practitioners considering the use of MCII should consequently ensure there is enough time for all steps of the exercise to be completed and be sure to give specific directions regarding the alignment of plans to obstacles.

Research questions two through four. Research questions two through four from the outcome evaluation are considered together because they all relate to both medium- and long-term outcomes and because potential explanations for findings (e.g., quasi-experimental study design) are similar across these research questions. The intervention's medium-term outcomes included on-time assessment completion and time management self-efficacy in online courses; the long-term outcomes included online course completion and grades. When considering all participants, the intervention did not seem to positively affect any of the medium- or long-term outcomes measured within the term of the intervention, nor did it demonstrate more positive results when male and female subgroups were considered separately. Descriptive statistics offered some promising evidence for the use of the intervention with students with low GPAs, but the evidence was limited. The following sections explain these contentions in detail.

All participants. The multiple regression models for the full group of participants suggested that the intervention did not have a significant relationship to time management self-efficacy or course grades in online courses, and that the intervention may have had a significant negative relationship to on-time assessment completion. Similarly, there was not a significant association between intervention participation and successful completion of online courses. The overall lack of positive evidence associated with the intervention, and evidence for a potential negative relationship to on-time assessment completion, was somewhat surprising given the strength of the results on similar outcomes demonstrated by other studies assessing similar interventions in higher or adult education settings (Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et al., 2015; Saddawi-Konefka et al., 2017; Schippers et al., 2015).

The results of three separate randomized control trials conducted by Oettingen et al. (2015) indicated that MCII interventions might positively affect time scheduled for planned

activities, individual perception of time management, and class attendance. Another randomized study, conducted by Saddawi-Konefka et al. (2017) with medical residents, indicated that MCII might support time spent studying and individual perception of time management. Finally, Kizilcec and Cohen (2017) found that MCII might positively affect successful course completion in MOOCs. Although none of these prior studies of MCII in higher or adult education settings evaluated grades as an outcome, they did demonstrate positive outcomes related to MCII for time management skills (i.e., as assessed by attendance or time scheduled or spent on specific activities; Oettingen et al., 2015; Saddawi-Konefka et al., 2017), perception of time management (Oettingen et al., 2015; Saddawi-Konefka et al., 2017), and course completion (Kizilcec & Cohen, 2017). MCII also positively affected grades for middle school students in Duckworth et al.'s (2013) study.

MCII activities were one key component of the intervention, the other being the initial goal setting activity. The intervention on which the goal setting activity in this study was based was found to positively relate to number of credits earned and retention rates for male and ethnic minority students at a school of management in the Netherlands (Schippers et al., 2015) and to GPA and retention among Canadian college students with low GPAs (Morisano et al., 2010). Therefore, multiple prior researchers have demonstrated positive relationships between similar interventions and outcomes similar to those measured in this study. Possible reasons for differences between the findings of this study and prior research are discussed later in this chapter.

Other variables. The first research question of the outcome evaluation focused on the intervention as an independent variable. However, findings associated with the multiple regression models surfaced other potential variables, initially included as covariates, which

might warrant attention relative to outcomes in online higher education settings. First, one regression model indicated that student identification as a race or ethnicity traditionally underrepresented within higher education institutions in the United States was significantly predictive of a lower rate of on-time assessment completion (see Table 29). All three regression models for grades indicated that this same variable was significantly predictive of lower grades in online courses. Given the opportunity gaps that have long harmed students of color in education systems (Ladson-Billings, 2006) and evidence that online education may further disadvantage students of color (Figlio et al., 2013; Kaupp, 2012; Xu & Jaggars, 2014), online educators must consider equity and anti-racism in their work. Future exploration of the experiences of students of color in online education is recommended.

Second, participants' responses to certain items on the pre-intervention survey were significantly predictive of post-intervention time management self-efficacy for online learning in all three regression models for time management self-efficacy. Specifically, pre-intervention time management self-efficacy and perception of workload as manageable positively predicted post-intervention time management self-efficacy. Although the relationship between the pretest and posttest measures of the same construct (i.e., time management self-efficacy) is hardly surprising, these results suggest that online educators might use a survey at the beginning of a term or course to identify students who might need extra support with time management in online learning.

Gender-based subgroups. Male students may be disadvantaged in online education compared to female students (Figlio et al., 2013; Kuo & Belland, 2016; Rovai, 2002; Xu & Jaggars, 2014). At the graduate school of education in this study, a needs assessment indicated that male students had significantly lower time management self-efficacy in the online learning

environment than female students (see Chapter 2 for more detail). Consequently, the intent of the intervention was to help all students with time management and related outcomes, but also to help male students in particular. The intervention conducted by Schippers et al. (2015) was chosen as the basis for the goal setting activity in this study partially based on the findings that it closed gaps between male and female students in terms of credits earned and retention. Unfortunately, in this study, findings for gender-based subgroups were similar to the findings for all participants; evidence did not suggest the intervention positively affected either male or female subgroups of students. Given the positive results for male students associated with the similar goal setting activity in Schippers et al.'s work, the findings in this study may have been limited by the low number (n = 32) of male participants. Further research with a focus on male students in online settings is therefore recommended due to the lower rates of success (Cochran et al., 2014; Figlio et al., 2013; Xu & Jaggars, 2014) and weaker experiences (Kuo & Belland, 2016; Rovai, 2002) male students in online courses can have as compared to female students.

GPA-based subgroups. Students with low GPAs are the subgroup of focus in this study's problem of practice because they may complete online courses at lower rates (Cochran et al., 2014; Xu & Jaggars, 2014) and receive lower grades in online courses (Figlio et al., 2013; Xu & Jaggars, 2014) as compared to students with higher GPAs or as compared to performance in face-to-face cousres. Based on the needs assessment in this study (see Chapter 2 for more detail), as with male students, students with low undergraduate GPAs (i.e., < 3.00) had significantly lower self-efficacy for time management in the online learning environment than students with higher GPAs. The goal setting activity in the intervention was partially chosen based on its potential to impact students with low GPAs (Morisano et al., 2010) as well as male students (Schippers et al., 2015), in particular.

In contrast to the findings for the full sample and for the male and female subgroups, the findings for the subgroup of students with low undergraduate GPAs were somewhat more promising, though far from conclusive. For the subgroup of students with undergraduate GPAs below 3.00, descriptive statistics indicated that participants in the treated group performed better on each of the intervention's intended medium- and long-term outcomes than those in the untreated group. However, for students with low GPAs, difference in means tests did not reveal any significant differences between treated and untreated groups for on-time assessment completion, time management self-efficacy, or course grades. Similarly, there was not a significant association between the intervention and successful course completion among this subgroup.

Despite the lack of significance associated with findings, the fact that students who received the intervention performed better than those who did not among students with low GPAs represented a different trend than existed for either the full group of participants or any other subgroup investigated. Additionally, the low number of participants with undergraduate GPAs below 3.00 (n = 29) may have contributed to the lack of significance of the findings. The evidence suggests that further study of the intervention would be useful with students with low GPAs to determine if it does indeed differentially positively affect this subgroup of students.

***Possible explanations for medium- and long-term outcomes*.** Both components of the intervention, the initial goal setting activity and the four MCII exercises, were chosen based on evidence from rigorous empirical studies (i.e., Schippers et al., 2015), including randomized control trials (Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et al., 2015; Saddawi-Konefka et al., 2017), which suggested the intervention could improve time management and associated outcomes. However, findings of this study included limited evidence for the

effectiveness of the intervention, as well as evidence suggesting participation in the intervention was potentially predictive of a decreased rate of on-time assessment completion in online courses. One explanation for these results is that the intervention, including the theory behind it, was ineffective, potentially mirroring a trend of failure to replicate positive results in the psychological sciences (Open Science Collaboration, 2015). However, this was not a replication study; the methodology did not include a randomized control trial, for example. Additionally, lack of impact cannot be concluded definitively when plausible alternative explanations exist (Leviton & Lipsey, 2007). Plausible alternative explanations that apply in the case of this study include sample bias due to the quasi-experimental methodology and low participation rate; limitations in the fidelity of implementation; and findings associated with short-term outcomes, all of which are discussed in more detail in the following sections.

Sampling bias. Sampling bias may have influenced the findings in two main ways. First, the quasi-experimental design meant that participants were not randomly assigned to the treated and untreated groups. Therefore, characteristics of participants in the treated and untreated groups may have differed for reasons other than chance, potentially influencing outcomes (Shadish et al., 2002). For example, confounding variables such as incoming differences in time management self-efficacy might have caused differences in outcomes (e.g., those with higher incoming time management self-efficacy might have higher time management self-efficacy after the intervention as well as stronger time management skills for reasons unrelated to the intervention). The evaluation design did include measures to control for such differences, but could not do so perfectly.

Continuing with the example of incoming time management self-efficacy, participants completed the time management subscale of Zimmerman and Kulikowich's (2016) online

learning self-efficacy measure at the beginning of the term in which the intervention ran. Subsequently, pre-intervention time management self-efficacy was included as a covariate in all initial multiple regression models used to analyze quantitative data. Models including pretest data as well as additional covariates (e.g., undergraduate GPA or use of time management resources outside of the intervention) are among the strongest types of regression models that can be used to support causal inferences (Henry, 2010). However, multiple regression could only be used for three of the four quantitatively measured outcomes because the fourth outcome (i.e., successful online course completion) was a categorical variable. Additionally, the inclusion of pre-intervention time management self-efficacy reduced the sample size in regression models by more than half as compared to models in which no questionnaire variables were included. Therefore, pre-intervention time management self-efficacy was eliminated from four of the eight regression models used to interpret quantitative findings.

For the example of incoming time management self-efficacy, incoming self-efficacy was lower among students in the treated group (M = 3.9) than in the untreated group (M = 4.0). Although the difference was small and not significant (see Appendix J), not all quantitative analysis methods controlled for this difference, nor for the difference in other potential confounding variables, both measured and unmeasured. One measured variable of particular concern is year in graduate school because a chi-squared test indicated a significant association between participation in the intervention and year in graduate school (see Appendix J). A higher proportion of participants in the treated group (58%) were in their first year of graduate school, as compared to in the untreated group (27%). However, the directionality of any potential effect of this association on the intervention's outcomes is unclear. In the initial selection of variables for measurement, it was hypothesized that year one students might struggle more with time

management than year two students (see table 9), suggesting potentially lower outcomes among year one students. However, such a difference would also mean that year one students had a greater need for a time management intervention than year two students, and therefore an associated prediction could be that year one students would benefit more, not less, from the time management intervention. There were not significant differences between treated and untreated groups or significant associations with the intervention for other measured variables (see Appendix J and process evaluation question three).

In addition to the elimination of measured covariates from some multiple regression models, two independent variables that were initially predicted to potentially impact the intervention's outcomes, course instructor and campus location, were not included in any regression models because they would have necessitated the inclusion of 19 and 15 dummy variables, respectively. Furthermore, regression models were not used for comparisons of outcomes by gender or by undergraduate GPA because of the reduced sample size among the subgroups. Therefore, although the study as designed included methods for controlling predicted confounding variables, not all predicted confounding variables were controlled for during any given analysis procedure.

Limited sample size might have also introduced bias into the analysis. Of the 487 students invited, 157 agreed to participate in the study. The convenience sampling approach (e.g., inviting all potential participants, and including all who agreed to participate) meant that the participants included in the study might not have been representative of the population of online graduate students at the graduate school, especially given the low participation rate of 32%. Therefore, differences between the participants and the rest of the population may have contributed to the lack of results, either positive or negative, associated with the intervention.

Fidelity of implementation. Unlike sampling bias, which may have erroneously either increased or decreased the relationships between the intervention and its intended medium- and long-term outcomes, fidelity of implementation issues tend to decrease the measured impact of an intervention (Leviton & Lipsey, 2007). As surfaced by the process evaluation, two fidelity of implementation limitations may have influenced the intervention's outcomes. First, a low intervention dose (i.e., receiving two or fewer MCII exercises) for approximately one quarter of participants could have plausibly contributed to the apparent lack of impact of the intervention as compared to previous studies of MCII exercises (Kizilcec & Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2017). Second, lack of sufficient time for the MCII activities was a fidelity limitation indicated by both faculty and student participants. Insufficient time to engage in the intervention could also have plausibly contributed to the limited results found in this study relative to other studies of MCII exercises (Kizilcec & Cohen, 2017; Oettingen et al., 2015; Saddawi-Konefka et al., 2017).

Short-term outcomes. During the evaluation of short-term outcomes, weaknesses in participant goals and plans emerged, which may have reduced any potential positive effects of the intervention on measured outcomes. In each round of MCII, between 11% and 22% of participant goals were unrelated to online coursework. In these situations, the intervention may have helped the participant achieve an outcome unrelated to the current study (e.g., weight loss), but would not theoretically have supported the intended outcomes of the intervention. Although written directions prompted participants to pick a goal related to their online coursework, two of the six facilitators observed implementing MCII exercises did not verbally remind participants to pick goals related to online coursework. Furthermore, based on the intervention design, participants were prompted to revisit the initial goal setting activity before each round of MCII.

This may have been a flaw in the design of the intervention itself because the initial goal setting activity included personal goals (e.g., a participant might choose a weight loss goal), which could have contributed to some participants choosing goals unrelated to online coursework in each round of MCII.

The evaluation of short-term outcomes also revealed that participant goals were only specific 48% to 66% of the time depending on which activity (i.e., initial goal setting activity or round of MCII) was evaluated and participant plans were only aligned to obstacles in 53% to 70% of cases depending on the MCII round. As previously discussed in the section on research question one for the outcome evaluation, the intervention may not have been as effective as it could have otherwise been for participants who wrote vague goals or who wrote plans that were not aligned to the obstacles that they identified. The theory of treatment (see Figure 11) indicates that short-term outcomes drive medium-term outcomes, which in turn drive long-term outcomes.

Similarly, the issues with short-term outcomes described in this section represent issues in the forethought phase of Zimmerman's (2002) self-regulated learning cycle. The forethought phase drives the performance phase (e.g., as might be measured by on-time completion of assessments) of the cycle (Zimmerman, 2002), and so issues in the forethought phase can theoretically lead to weaknesses in performance. Therefore, in cases in which participants did not achieve short-term outcomes, improvements in medium- and long-term outcomes would be unlikely to follow.

Intervention efficacy. The intervention may not have yielded significant positive results for a variety of reasons, described above, other than a lack of effectiveness inherent in the intervention. However, given the results of this study, the efficacy of the intervention itself should also be considered. Another possible explanation for the results is that participants in the

untreated group received instruction or activities during the time that was otherwise used for MCII exercises in the treated group that were at least as supportive of time management and associated outcomes as the MCII exercises. Despite the strengths of previous empirical work on similar interventions, there were also limitations. Of the studies that tested short MCII exercises relative to time management or related outcomes in higher or adult education settings, all but Kizilcec and Cohen's (2017) had sample sizes under 100. Additionally, although both Morisano et al. (2010) and Schippers et al. (2015) found positive results associated with a goal setting activity similar to the one in this study, Oreopoulos and Petronijevic's (2018) study of a similar intervention did not demonstrate an effect. Given the results of this study, and the strengths and limitations of previous work, additional research is recommended.

Summary of Limitations

The major limitations of this study have all been described in previous sections of this discussion of findings. To summarize, the findings of the process evaluation indicated that across the dimensions of fidelity (i.e., adherence, dose, quality of delivery, participant responsiveness, and program differentiation; Dusenbury et al., 2003), two issues with fidelity of implementation may have influenced outcomes. First, 26% of participants received a low dose of the intervention (i.e., received two or fewer MCII exercises). Second, insufficient time for MCII exercises appeared to be an issue for some participants.

Whereas the process evaluation identified limitations to the study based on fidelity of implementation, the outcome evaluation identified limitations related to the design of the intervention itself and the study design. In terms of intervention design, having participants revisit the initial goal setting activity before each MCII exercise may have been a mistake, as it might have encouraged some participants to choose goals unrelated to online coursework during

MCII exercises. Additionally, the facilitation script for MCII exercises should have made explicit references to writing specific goals and to writing plans that aligned to obstacles. In terms of study design, the quasi-experimental approach involving a convenience sample of participants and nonrandom assignment to treated and untreated groups may have introduced bias into outcome measures. Although the use of multiple regression during quantitative analysis allowed for the control of some potential confounding variables, it did not control for all potential confounding variables across outcomes.

Implications

Before deciding that the intervention in this study did not work for students in online courses, additional testing is likely worthwhile due to the strength of the evidence in other empirical studies of similar interventions (i.e., Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et al., 2015; Schippers et al., 2015; Saddawi-Konefka et al., 2017) and the potential that the intervention may be particularly useful for students with low GPAs. However, one empirical study of an intervention similar to the goal setting activity in this study (Oreopoulos & Petronijevic, 2018) demonstrated no effect, again indicating that further research is warranted. Testing other interventions, such as one-on-one coaching (Bettinger & Baker, 2014; Oreopoulos & Petronijevic, 2018), for time management outcomes specifically would also be useful.

For practitioners implementing a similar intervention or researchers evaluating such an intervention, the process evaluation in this study indicated that small changes to facilitator training and scripts could increase the likelihood that the intervention may lead to positive outcomes. Specifically, directions prompting participants to revisit their initial goal setting activity before each MCII exercise should be removed, potentially helping to ensure participants write goals related to online coursework and have enough time to complete MCII exercises. The

facilitation script for MCII exercises should also include explicit directions about writing a single specific goal and writing a plan that directly addresses the participant's identified obstacle. Finally, during training, facilitators could evaluate examples of participant writing from MCII exercises for the characteristics of strong goals, obstacles, and plans, and practice giving feedback to help improve the quality of participant writing during these exercises.

With the improvements to the intervention design and implementation described above, further evaluation of the outcomes of a similar intervention might yield different results. If possible, future evaluations would also benefit from a larger participant group and random assignment to treated and untreated groups. A larger participant group might be achieved by changing the timing of participant recruitment. In this study, participants were recruited before and during their first class of the fall term. Waiting until the spring term might make students more comfortable in agreeing to participate because they would likely be more familiar with the institution and with online instruction in the spring than in the fall.

Random assignment of participants to class sections can be impractical in higher education settings, including the one in this study. With a large enough group of faculty members agreeing to participate in an evaluation study, randomization might be achieved at the class rather than individual level. When random assignment cannot be achieved, future research with a larger and more representative sample of participants might use a similar approach to multiple regression as that used in this study, but with more complete data, to reevaluate the effectiveness of an intervention like this one.

Despite the limitations of this study, the findings also point to the importance of process evaluation and a mixed methods approach. None of the intervention studies on which this intervention design was based (i.e., Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et

al., 2015; Schippers et al., 2015; Saddawi-Konefka et al., 2017) included a process evaluation. A narrow focus on outcome variables can limit the explanatory power of the study (Bamberger, Tarsilla, & Hesse-Biber, 2016). In this study, attention to the intervention's fidelity of implementation and qualitative outcomes (i.e., those associated with participants' written goals and plans) provided possible explanations for the quantitative outcomes. For example, insufficient time, a finding from the process evaluation, may have limited the efficacy of the intervention. Similarly, limitations in short-term outcomes, such as lower rates of goal specificity as compared to goal feasibility, may have affected medium- and long-term outcomes. Finally, the findings of the process evaluation indicated that relatively simple interventions (i.e., short, and with a set script as in this intervention) can still have fidelity of implementation issues. Consequently, this study highlights the need for practitioners to attend to qualitative and process data when implementing interventions.

Even when a process evaluation is present in an evaluation study, all fidelity dimensions should be assessed to maximize the strength of the inferences about the intervention's outcomes (Dusenbury et al., 2003). For example, in this study, all intervention facilitators indicated that they facilitated all steps of the MCII exercises each time, indicating adherence was strong. However, evaluating participant attendance and the number of rounds of MCII exercises each instructor facilitated revealed a problem with another dimension of implementation fidelity, dose. About one-quarter of participants did not receive at least three of the four planned MCII exercises. Therefore, findings from this study illustrate why practitioners should interpret results of quantitative-only intervention evaluations and intervention evaluations that do not include comprehensive process evaluations with caution.

Finally, future use of this intervention might best be tested among students with low GPAs. The subgroup of participants with undergraduate GPAs lower than 3.00 in this study was the only subgroup for which descriptive statistics indicated that participants in the treated group outperformed participants in the untreated group on medium- and long-term outcomes. However, none of the differences between the treated and untreated groups among students with low GPAs was significant. Additionally, multiple regression was not used for this subgroup, so uncontrolled variables may have contributed to the outcomes. The positive trend associated with participation in the intervention for students with low GPAs may have been due to random chance or uncontrolled differences between groups, but also warrants further attention. A larger study could reveal whether the intervention addresses some of the unique disadvantages faced by students with low GPAs in online courses.

Conclusion

A time management intervention for students taking online courses, which included a goal setting activity followed by four rounds of MCII exercises across one term of instruction, did not demonstrate any significant positive results on the intended outcomes of on-time assessment submission, time management self-efficacy, successful course completion, or course grades in the online environment. The intervention was based on studies of previous interventions with empirical evidence suggesting a positive impact on similar outcomes (Kizilcec & Cohen, 2017; Morisano et al., 2010; Oettingen et al., 2015; Schippers et al., 2015; Saddawi-Konefka et al., 2017). The lack of evidence for a positive impact in this study may have been due to fidelity of implementation issues surfaced by the study's process evaluation. Specifically, about one-quarter of participants received only three of the four planned MCII exercises, and insufficient time for MCII exercises was an issue for a subset of facilitators and participants. The

quasi-experimental design may also have contributed to this study's outcomes, as non-random differences between groups receiving and not receiving the intervention could have introduced bias into outcome measurements.

Based on the evidence from this study, future practitioners and researchers seeking to improve time management among higher education students should attend to feasibility of implementation with fidelity and consider experimental research design when possible if choosing to implement an intervention similar to this one. Furthermore, this study demonstrated the importance of process evaluation and qualitative data in providing insight into outcomes in an evaluation study. Therefore, experimental quantitative research on similar interventions should also include qualitative data and attention to the process of intervention implementation.

Finally, because descriptive statistics indicated that the intervention could be associated with positive outcomes for students with low GPAs in online courses, practitioners and researchers should also consider testing the intervention specifically with this subgroup in online courses. Attention to students with low GPAs is particularly important in online courses given that such students may earn lower grades when taking courses online as compared to courses in face-to-face environments (Figlio et al., 2013; Xu & Jaggars, 2014), and may complete online courses at lower rates than students with higher GPAs (Cochran et al., 2014; Xu & Jaggars, 2014).

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Appendix A

Original and Revised Needs Assessment Survey Items

Table A1

Teaching Presence Items

Original item (Arbaugh et al., 2008)	Revised item for survey implementation and rationale, if applicable
1. The instructor clearly communicated important course topics	No revision
2. The instructor clearly communicated important course goals	No revision
3. The instructor provided clear instructions on how to participate in course learning activities	No revision
4. The instructor clearly communicated important due dates/time frames for learning activities	No revision
5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn	Revision: delete item entirely Rationale: Respondent expressed confusion, and based her response on her general perception of the course as well as her perception of the alignment of the course materials to each other. Interviewer also lacked clarity on whether agreement and disagreement referred to individual student's perspectives relative to those presented in the course, agreement and disagreement among students in the course, or agreement and disagreement among materials (e.g., work by different authors) presented in the course.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking	No revision
7. The instructor helped to keep course participants engaged and participating in productive dialogue	No revision

Original item (Arbaugh et al., 2008)	Revised item for survey implementation and rationale, if applicable
8. The instructor helped keep the course participants on task in a way that helped me to learn	No revision Note: Although the respondent pursuing a doctoral degree struggled to answer this question, she struggled as a result of feeling that this item would be best demonstrated in face-to-face classes and because she felt that students were already on task in her course. Given that the context of the problem of practice, however, involves regular synchronous classes in which students are expected to participate in a manner analogous to face-to-face classes, the item will be left as is.
9. The instructor encouraged course participants to explore new concepts in this course	No revision
10. Instructor actions reinforced the development of a sense of community among course participants	No revision
11. The instructor helped focus discussion on relevant issues in a way that helped me to learn	Revision: The instructor facilitated course discussions in a way that helped me to learn Rationale: Respondent expressed an interpretation of relevant issues as those directly applicable to her professional practice only, which could demonstrate a double-barreled interpretation of the item (e.g., first, did the instructor help focus discussion in a way that helped the respondent learn, and second, were the issues discussed relevant). The respondent also expressed some confusion over the meaning of "focus discussion."
12. The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives	No revision
13. The instructor provided feedback in a timely fashion	No revision

Table A2

Online Learning Self-Efficacy Items

Original item (Zimmerman & Kulikowich, 2016)	Revised item for survey implementation and rationale, if applicable
1. Navigate online course materials efficiently	No revision
2. Find the course syllabus online	No revision
3. Communicate with my instructor effectively via email	No revision
4. Communicate effectively with technical support via email, telephone, or live online chat	No revision
5. Submit assignments to an online drop box	Revision: Submit assignments (e.g., video, documents, etc.) by uploading files online Rationale: Respondent expressed confusion over whether different types of assignments should be considered in the question; drop box is not terminology used in the coursework in the context of the problem of practice.
6. Overcome technical difficulties on my own	No revision
7. Navigate the online gradebook	No revision
8. Manage time effectively	Revision: Manage time effectively when learning online Rationale: Respondent interpreted the question as referring to all aspects of life (e.g., job, school, social, etc.)
9. Complete all assignments on time	No revision
10. Learn to use a new type of technology efficiently	No revision
11. Learn without being in the same room as the instructor	No revision
12. Learn without being in the same room as other students	No revision
13. Search the Internet to find the answer to a course-related question	No revision

Original item (Zimmerman & Kulikowich, 2016)	Revised item for survey implementation and rationale, if applicable
14. Search the online course materials	Revision: Search the online course materials to find a specific resource or to find the answer to a question Rationale: Respondent interpreted the question as meaning searching for a term within a specific course document.
15. Communicate using asynchronous technologies (discussion boards, email, etc.)	Revision: Communicate using asynchronous technologies (Canvas comments, email, etc.) Rationale: Respondent expressed that she would rate herself differently on the different asynchronous formats. Discussion boards are rare or nonexistent in online courses in the context of the problem of practice. Additionally, Canvas is the learning management system in the context of the problem of practice, and Canvas comments operate similarly to email (e.g., they generally occur between student and professor, and generate an alert in recipient's inbox). Therefore, the example of discussion boards was replaced with a more relevant and consistent example.
16. Meet deadlines with very few reminders	No revision
17. Complete a group project entirely online	Revision: delete item entirely Rationale: Respondent expressed confusion as to whether to respond according to her perception of her ability to complete the project (noting that she might take charge and complete a high quality project) or whether to respond according to her perception of her ability to work with others (noting that she might not be inclusive of all other group members). Given that group projects are not included in coursework in the context of the problem of practice, the item can simply be deleted.
18. Use synchronous technology to communicate with others (such as Skype)	Revision: Use synchronous technology to communicate with others (such as Skype or Zoom) Rationale: Although the respondent was able to answer the item with Zoom in mind, because Zoom is used in the context of the problem of practice, the extra example ensures clarity.
19. Focus on schoolwork when faced with distractions	No revision
20. Develop and follow a plan for completing all required work on time	No revision

Original item (Zimmerman & Kulikowich, 2016)	Revised item for survey implementation and rationale, if applicable
21. Use the library's online resources efficiently	No revision
22. When a problem arises, promptly ask questions in the appropriate forum (email, discussion board, etc.)	No revision

Note. Items 8, 9, 16, 19, and 20 comprise the time management subscale, which was prioritized for use in the outcomes evaluation based on participant responses to items on this scale during the needs assessment.

Appendix B

Semi-Structured Interview Questions

The following questions will be included in the semi-structured interviews that are part of the needs assessment. All participants will be asked the questions not designated as follow up questions exactly as worded. Follow up questions may be flexibly used based on participant responses.

- Tell me about your experience with interacting with your instructor in your online course.

  Potential follow up questions:

  - Can you tell me more about your experience with [interaction participant mentioned]?
  - Are there any other ways you interact with your professor in your online course? Can you tell me more about your experience with [new interaction participant named]?
  - Can you describe interactions that you have had with your instructor that have been particularly helpful or insightful?
  - Which interactions with your instructor have been most useful? Why?
  - Which interactions with your instructor have been least useful? Why?
- Tell me about your experience with interacting with technology in your online course.

  Potential follow up questions:

  - Can you tell me more about your experience with [interaction participant mentioned]?
  - Are there any other ways you interact with technology in your online course? Can you tell me more about your experience with [new interaction participant named]?

    - Which interactions with technology have been most useful? Why?
    - Which interactions with technology have been least useful? Why?
- Potential overarching follow up question at the conclusion of the interview: Of the interactions you've talked about so far, which have been the most useful? And what about the least useful?

Appendix C

Codes used for Observational Data Analysis

Code	Definition	Source
	External Environment	
Non-course responsibilities	Learner responsibilities outside of the immediate course environment (e.g., family, work, financial)	Inductive
Physical environment	An aspect of the learner's physical environment that would not likely be present in a face-to-face learning setting (e.g., a child).	Inductive
Physical separation	Physical distance between learner and instructor or other learners	Inductive
	Learner Perceptions	
Classroom feeling	Learner perception of the synchronous learning environment as similar to a physical classroom	Inductive
In-person comparison	Learner comparison of online and face-to-face learning	Inductive
	Leaner-instructor Interaction	
Affective instructor support	Learner-instructor interaction in which the instructor supports the learner(s) through encouragement or advice.	(Moore, 1989; Shackelford & Maxwell, 2012a)
Check for understanding	Learner-instructor interaction in which the instructor assesses learner understanding or skill formally (e.g., via a test) or informally (e.g., via questioning in class).	(Moore, 1989)
Discussion facilitation	Learner-instructor interaction in which the instructor guides a discussion involving multiple learners.	(Shackelford & Maxwell, 2012a)
Feedback	Learner-instructor interaction in which the instructor provides feedback to the learner.	(Moore, 1989; Shackelford & Maxwell, 2012a)
Feedback quality	An element of feedback related to the learner's perception of the usefulness of instructor feedback.	(Shackelford & Maxwell, 2012a)

Code	Definition	Source
Feedback timing	An element of feedback related to the duration of time between the learner completion of a task and the instructor provision of feedback to the learner, as well as to the frequency with which the instructor provides feedback to the learner.	(Shackelford & Maxwell, 2012a)
Individual learner-instructor dialogue	Learner-instructor interaction that includes a focus on a single learner's understanding or development.	(Moore, 1989; Shackelford & Maxwell, 2012a)
Instructor adjustment	Learner-instructor interaction in which the instructor adjusts the learning environment, task, content, or sequence based on information from checks for understanding or issues that arise during learning (e.g., technological difficulties or limited time for a planned activity).	(Moore, 1989) Inductive Revision
Instructor content presentation	Learner-instructor interaction in which the instructor conveys course content through direct instruction or the modeling of a skill or thought process.	(Moore, 1989; Shackelford & Maxwell, 2012a)
Instructor flexibility	Learner-instructor interaction in which the instructor demonstrates flexibility based on the learner's circumstances (e.g., by offering an extension)	Inductive
Instructor framing	Learner-instructor interaction in which the instructor conveys expectations (e.g., for communication or task completion) or previews learning activities, sequences, or goals.	(Shackelford & Maxwell, 2012a)
Instructor motivation	Learner-instructor interaction in which the instructor seeks to motivate the learner(s) via interest, communication of purpose or importance, or the encouragement of "self-direction and self-motivation" (Moore, 1989, p. 2).	(Moore, 1989) Inductive Revision
Practice facilitation	Learner-instructor interaction in which the instructor facilitates learners' application of desired skills or understandings through practice. Instructor assessment of knowledge and skills during practice may also serve as a check for understanding.	(Moore, 1989)

Code	Definition	Source
Technology modeling	Learner-instructor interaction in which the instructor provides scaffolded support for technology use in the form of a model. Distinct from technology introduction because the purpose is not to introduce or orient. Rather, the technology model is required in the moment to facilitate another desired interaction (e.g., discussion of content).	(Shackelford & Maxwell, 2012) Inductive Revision
	Learner-interface Interaction	
Complex technology	Indication of complex or difficult to use technology.	(Falloon, 2012; Teo & Wong, 2013)
Interface design	The structure of technological interfaces used in online courses (e.g., the separation of course functions such as discussion forums and course documents in an online course).	(Swan, 2003)
Linking	Interface facilitation of connection between resources and content via links.	(Swan, 2003)
Navigation	Learner-interface interaction that requires the learner to complete multiple steps to achieve a desired goal (e.g., find a resource in a course folder).	(Swan, 2003)
New experience	Learner interaction with either (a) a technology that has never been used before; or (b) with a technology that is being used in a way new to the learner	Inductive
Page design	The structure of webpages used in online courses (e.g., the extent of scrolling required, or the layout of text on the page).	(Swan, 2003)
Reference later	Learner return to instructional materials available via technology after initial exposure.	Inductive
Simple technology	The opposite of complex technology; technology that is easy to use.	Inductive
Technological familiarity	Learner-interface interaction that feels comfortable to the learner due to a perception of familiarity with the technology.	Inductive

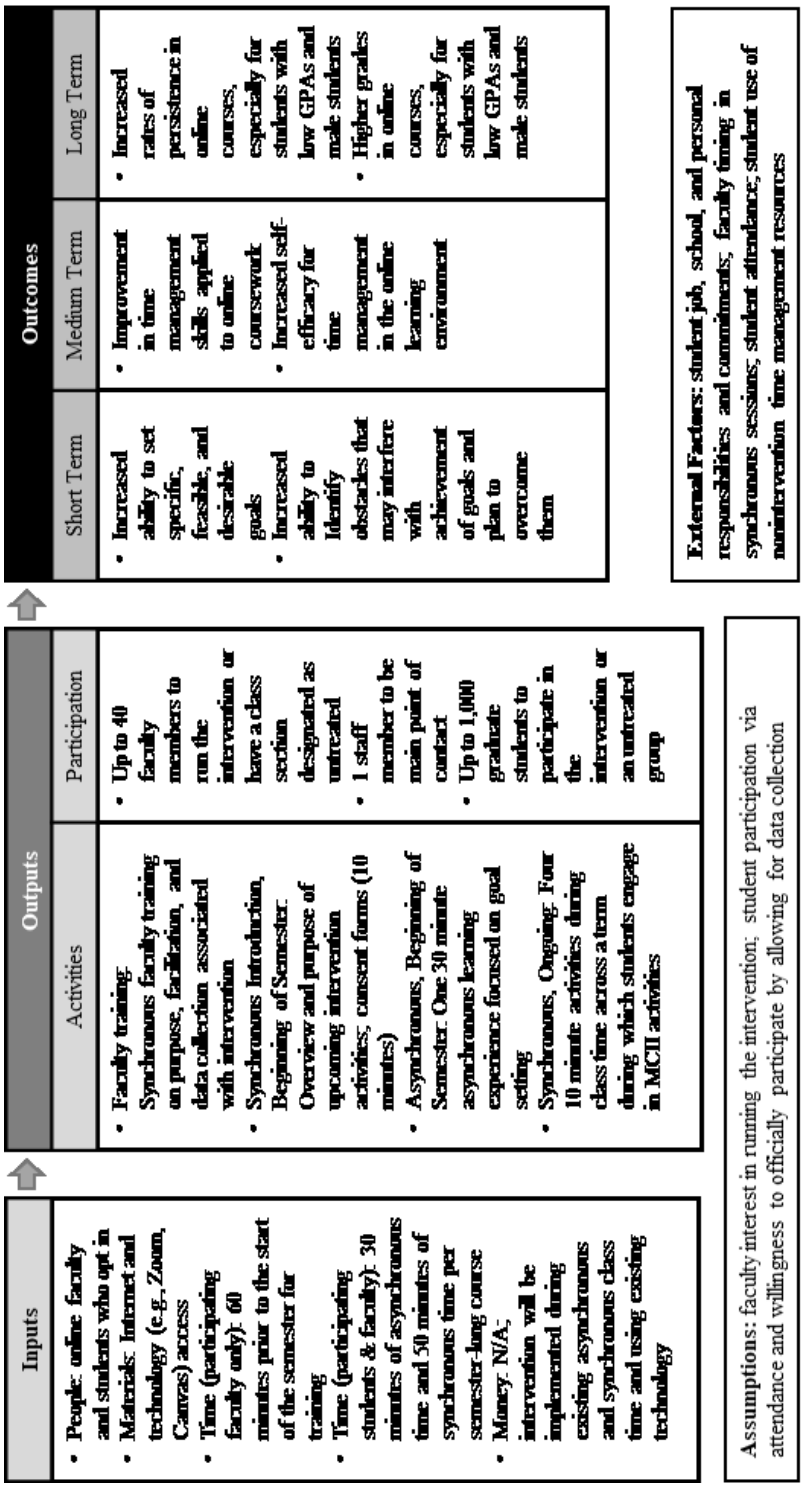
Code	Definition	Source
Technology introduction	Scaffolds provided to orient learners to the main interface(s) used in an online course. For example, a syllabus that includes an orientation to the course layout as structured in the learning management system. Or, a video tutorial on how to use technology required for successful course participation.	(Swan, 2003)
Technology issue	An instance in which technology does not perform or function as expected.	Inductive
Technology transfer	Learner use of technology introduced to the learner via an online course in another setting (e.g., use of technology from their online course with their own students).	Inductive
Technology troubleshooting	Resources provided (e.g., institutional IT personnel) to help students who encounter problems when interacting with technology.	(Swan, 2003)
Vicarious interaction via technology	An interaction between a learner and course content that occurs when the learner observes others' actions without directly participating. The vicarious interaction is made possible by technology. For example, a learner reading but not responding to threads in a discussion forum.	(Swan, 2003)
	Learner-Learner Interaction	
Asynchronous discussion	Learner-learner interactions that occur asynchronously, for example in a discussion forum or via email.	(Shackelford & Maxwell, 2012b)
Ice-breaker	A structured activity that facilitates learner-learner interactions in a way intended to develop community and/or allow learners to get to know each other.	(Shackelford & Maxwell, 2012b)
Interruption	Learner interruption in discussion with other learners or with instructor.	Inductive
Leaner resource exchange	Leaner-learner interaction in which learners share resources with each other.	(Shackelford & Maxwell, 2012b)
Learner background	Leaner-learner interaction in which students learn about each other's backgrounds.	(Shackelford & Maxwell, 2012b)

Code	Definition	Source
Learner content presentation	Learner-learner interaction in which one learner conveys course content through direct explanation or the modeling of a skill or thought process.	(Moore, 1989; Shackelford & Maxwell, 2012b)
Peer feedback	Leaner-learner interaction in which feedback is given or received. May include positive or critical feedback.	Inductive
Small group discussion	Leaner-learner interaction in which multiple students engage in discussion; discussion does not involve the whole class. Likely to be present in small group task situations, but may also occur outside the presence of specific tasks for completion.	(Shackelford & Maxwell, 2012b)
Small group task	Learner-learner interactions in which multiple learners collaborate to complete a task.	(Moore, 1989; Shackelford & Maxwell, 2012b)
Social interaction	Informal learner-learner interaction not focused on course content or tasks. May overlap with learner background.	(Shackelford & Maxwell, 2012b)
Whole group discussion	Leaner-learner interaction in which the whole class engages in discussion. May be facilitated by the instructor, but code focuses on interaction between learners during discussion.	(Shackelford & Maxwell, 2012b)
	Multiple Interaction Types	
Directions clarification	Learner-learner or learner-instructor interaction in which directions are asked about or clarified during an activity.	Inductive
Lull	Pause in discussion and interaction during a synchronous class. Lull may occur in learner-learner, learner-interface, or learner-instructor interactions.	Inductive
Misconception	Learner expression of an incorrect or incomplete understanding of content. May be expressed as part of a learner-learner, learner-interface or learner-instructor interaction.	Inductive

Code	Definition	Source
Personal experience or reflection	Interaction in which the sharing of personal experiences or reflections facilitates content interaction (e.g., a learner shares how she applied a specific teaching technique in her class, or asks for help regarding the application of a specific technique based on a challenge she has experienced).	(Shackelford & Maxwell, 2012b) Inductive Revision
Praise	Learner-learner or learner-instructor interaction in which praise is delivered. May overlap with instructor motivation or affective support as well as with feedback and peer feedback. When delivered by an instructor, is a form of modeling communication norms.	(Shackelford & Maxwell, 2012a) Inductive Revision
Technology explanation	An interaction (i.e., learner-instructor or learner-learner) involving the explanation of technology. Distinct from technology introduction because the purpose is not to introduce or orient. Rather, the technology explanation is required in the moment to facilitate another desired interaction (e.g., discussion of content).	Inductive
	Time	
Course timing	Organization of material in an online course over time (e.g., order of content presented, schedule of synchronous sessions)	Inductive
Time issue	An instance in a synchronous class in which an instructor or learner expresses that there is not enough time to complete a given activity or achieve a desired goal.	Inductive
Time management	Learner organization and completion of tasks related to online learning	Inductive

Appendix D

Intervention Logic Model



Appendix E

Faculty Participant Recruitment Emails

Initial Recruitment Email: Faculty

Hello Relay online faculty members!

I'm Alice Waldron, the Dean of Online Instruction here at Relay. As you may or may not know, I am currently pursuing my doctorate at Johns Hopkins University. As part of my studies, I am researching time management in online learning.

In the coming fall term, I am planning to test a time management intervention designed to help our students with time management in online courses. I am looking for faculty volunteers interested in running the intervention in their classes and faculty volunteers willing to have their classes designated to not receive the intervention for comparison purposes. You can learn more details about each of these options as well as about the need for the intervention by clicking here. [See next section of this appendix for the information that will be hyperlinked].

I'll take about 15 minutes in [name and date of upcoming full-time or adjunct faculty meeting] to tell you more about the study and ask you to choose whether or not to participate. Participation is completely optional. There are no individual benefits to participating and there are no repercussions for not participating. Your choice of whether or not to participate will have no impact on any job evaluations, pay, or future opportunities at Relay GSE.

If you choose to participate, you will indicate your consent by signing an electronic consent form during our upcoming meeting. You only need to sign the consent form if you are volunteering to run the intervention (you can volunteer to have your class designated as a group not receiving the intervention without signing the form because I will not collect any data from you in this case). There are also directions below that you can follow if you are willing to participate and would like to sign the consent form before our upcoming [name and date of upcoming full-time or adjunct faculty meeting].

Thank you for your consideration,

Alice

If you're willing to participate, and would like to sign the consent form before our upcoming meeting:

1. Respond to this email to let me know. Then, look out for an email from "SignRequest."
2. Once you have the email, click the green button in the email that says "review document," read the linked document (it will include more details about participation) and sign at the bottom of the linked document if you are still interested in participating after reading the form. SignRequest allows you to type your signature or use your mouse to sign. After you sign, you will click the green "finalize" button that appears at the top of the screen, and then confirm your signature.

Initial Recruitment Email: Faculty – Supplementary Materials

The following information will be provided in a Google document that is hyperlinked in the initial faculty recruitment email.

Why a time management intervention?

I observed, interviewed, and surveyed some of our online students in the spring term of 2018. The data collected suggested our online students, and in particular our male online students and online students with low undergraduate GPAs, struggle with time management in their online courses.

Volunteering to participate by running the intervention involves:

- Attending a 60-minute training with me on [specify date & time options].
- Having a 30-minute asynchronous goal setting activity for students added to the Canvas materials for your course. The activity will take place between the first and second synchronous classes of your course, and only needs to be scored for completion.
- Allowing me to attend the first synchronous class of the year OR playing a video of me describing the nature of the research in your first synchronous class of the year. This should take approximately 10 minutes.
- Facilitating four ten minute WOOP (wish, outcome, obstacle, plan) exercises for students during synchronous class time this term.
    - The WOOP exercise could take the place of your regularly scheduled community builder during classes in which you choose to use WOOP.
    - You can choose the four classes in which you want to implement the WOOP exercise so long as it is included in a synchronous class approximately once in each month from September to December.
    - Each WOOP exercise is the same, and asks students to visualize a wish for an upcoming period of time as well as outcomes associated with that wish. Students then identify an obstacle that might be a barrier to fulfilling the wish, and identify a plan for what they will do to overcome the obstacle.
    - You will be provided with a facilitation script and materials.
    - I will observe you facilitating the WOOP exercise once during the term for the purposes of collecting data about how the intervention is facilitated and providing follow up support to you if needed.
- Filling out a brief (about five minutes) survey about how you facilitated the WOOP exercise after each of the four times you use WOOP in your class.

Volunteering to have your class designated to not receive the intervention (for comparison purposes) involves:

- Attending a 15-minute training with me on [specify date & time options]. The purpose of this training is to understand what the intervention is so that you do not implement it or anything similar to it in your class this term.
- Allowing me to attend the first synchronous class of the year OR playing a video of me describing the nature of the research in your first synchronous class of the year. This should take approximately 10 minutes.

Follow-up Recruitment Email 1: Faculty

Hello Relay online faculty members!

It was great to see most of you on [date] and share a little bit about the research I'll be doing as part of my doctoral studies this year. You can learn more about my research by reviewing the initial email I sent on [date], the text of which is included below for your reference. **If you were at the meeting on [date] and have decided not to participate, no further action is required from you (you can also stop reading here).**

If you were either at the meeting and needed a little more time to think about your participation or missed the meeting but are interested in participating, please respond to this email within the next week letting me know if you are willing to:

a) Run the intervention in one or more of your class sections this term
b) Have one or more of your class sections this term be designated to not receive the intervention for comparison purposes
c) Do either of the above

In any of the above cases, I will follow up with information about next steps, and will email you a consent form to sign if you are volunteering to run the intervention (that email will come from "SignRequest"). Feel free to also respond with any questions you would like answered before making a decision or let me know if you'd like to set up a time to talk on Zoom to learn more before you decide.

However, remember that participation is not required. You do not need to respond to this email if you are not interested in participating. There are no individual benefits to participating and there are no repercussions for not participating. Your choice of whether or not to participate will have no impact on any job evaluations, pay, or future opportunities at Relay GSE.

Thank you for your consideration,

Alice

[Include text of original email here for reference]

Follow-up Recruitment Email 2: Faculty

Hello Relay online faculty members!

This is your final reminder to let me know if you'd like to participate in the study I am doing this term by either including a time management intervention in one or more of your online classes this term and/or having one or more of your online classes designated to not receive the intervention. You can learn more about my research by reviewing the initial email I sent on [date], the text of which is included below for your reference. **If you have decided not to participate, no further action is required from you and I will not email you again (you can also stop reading here).**

Please respond to me by the end of the day tomorrow if you are interested in participating.

Participation is not required. You do not need to respond to this email if you are not interested in participating. There are no individual benefits to participating and there are no repercussions for not participating. Your choice of whether or not to participate will have no impact on any job evaluations, pay, or future opportunities at Relay GSE.

Thank you for your consideration,

Alice

[Include text of original email here for reference]

Appendix F

Student Participant Recruitment Emails

Initial Recruitment Email: Treated Group

Hello students in [Faculty Member Name]'s [Day of the Week] section!

I'm Alice Waldron, the Dean of Online Instruction here at Relay. I am also a doctoral student at Johns Hopkins University researching time management in online learning. Your online course this term includes activities designed to support your time management. These activities include a self-paced goal setting activity (about 30 minutes), at the beginning of the term and four mental exercises (about 10 minutes each) that will take place during your synchronous class time throughout the term.

This term, I hope to learn about students' time management in online courses. If you agree to participate in my study, I will collect and use data relevant to your participation as part of the study. Data will be anonymized prior to final analysis and no data that could be used to individually identify you or [Professor Name] will be reported. Participation is completely optional. There are no individual benefits to participating that you will not also receive if you choose not to participate, and there are no repercussions for not participating.

On [class date], you will learn a little more about my research and be asked to choose whether or not to participate. If you choose to participate, you will indicate your consent by signing an electronic consent form, which will be emailed to you during the day before your class starts. If you choose not to participate, simply do not sign the consent form. There are also directions below that you can follow if you are willing to participate and would like to sign the consent form before class.

Thank you for your consideration,

Alice Waldron

If you're willing to participate, and would like to sign the consent form before class:

1. Look out for an email from "SignRequest" during the day on [class date]. If you'd like to look at the form earlier, you can respond to this email and I will send it to you earlier.
2. Once you have the email, click the green button in the email that says "review document," read the linked document (it will include more details about participation), and sign at the bottom of the linked document if you are still interested in participating after reading the form. SignRequest allows you to type your signature or use your mouse to sign. After you sign, you will click the green "finalize" button that appears at the top of the screen, and then confirm your signature.

Initial Recruitment Email: Untreated Group

Hello students in [Faculty Member Name]'s [Day of the Week] section!

I'm Alice Waldron, the Dean of Online Instruction here at Relay. I am also a doctoral student at Johns Hopkins University researching time management in online learning.

This term, I hope to learn about students' time management in online courses. If you agree to participate in my study, I will collect and use data relevant to your participation as part of the study. Data will be anonymized prior to final analysis and no data that could be used to individually identify you or [Professor Name] will be reported. Participation is completely optional. There are no individual benefits to participating, and there are no repercussions for not participating.

On [class date], you will learn a little more about my research and be asked to choose whether or not to participate. If you choose to participate, you will indicate your consent by signing an electronic consent form, which will be emailed to you during the day before your class starts. If you choose not to participate, simply do not sign the consent form. There are also directions below that you can follow if you are willing to participate and would like to sign the consent form before class.

Thank you for your consideration,

Alice Waldron

If you're willing to participate, and would like to sign the consent form before class:

1. Look out for an email from "SignRequest" during the day on [class date]. If you'd like to look at the form earlier, you can respond to this email and I will send it to you earlier.
2. Once you have the email, click the green button in the email that says "review document," read the linked document (it will include more details about participation) and sign at the bottom of the linked document if you are still interested in participating after reading the form. SignRequest allows you to type your signature or use your mouse to sign. After you sign, you will click the green "finalize" button that appears at the top of the screen, and then confirm your signature.

Follow-up Recruitment Email: Treated and Untreated Groups

Hello [student name],

I'm Alice Waldron, the Dean of Online Instruction here at Relay. I am also a doctoral student at Johns Hopkins University researching time management in online learning. You can learn more about my research by reviewing the initial email I sent on [date], the text of which is included below for your reference, or by reviewing the consent form you received via email from "SignRequest."

On [class date], your class learned a little more about my research and individuals were asked to choose whether or not to participate by signing an electronic consent form or not. **If you were in class and decided not to participate, no further action is required from you, and I will not email you again (you can also stop reading here).**

If you were either in class and decided to participate but did not sign the form or were absent from class and would like to participate, please review and sign the form that was emailed to you from "SignRequest." If you are receiving this email, I do not have a signature from you. But, remember that participation is not required. There are no individual benefits to participating that you will not also receive if you choose not to participate, and there are no repercussions for not participating. If you prefer not to participate, simply do not sign the consent form.

Last, if you are willing to participate but did receive an emailed consent form from "SignRequest" or are having difficulties signing the form, please let me know by responding to this email.

Thank you for your consideration,

Alice Waldron

[Text of initial recruitment email will be included here for reference; text is slightly different (see previous two pages) depending on whether student is in treated or untreated group].

Appendix G

MCII Faculty Implementation Questionnaire Items

During class I….

1. Had students revisit their initial goal setting activity before the WOOP exercise.	☐ Yes	☐ No
2. Played the audio for the WOOP exercise OR gave directions for the WOOP exercise myself using the established protocol.	☐ Yes	☐ No
3. Gave students time to write down key words representing each step of WOOP.	☐ Yes	☐ No

4. If you chose No for any of the items above (1-3), please provide a brief explanation.

5. Did your facilitation of the WOOP exercise change in any way from the last time you facilitated the exercise? If so, please describe.

Appendix H

MCII Observation Checklist and Descriptive Report Template

Framing			
Did the instructor ask students to revisit their initial goal setting activity before engaging in the WOOP exercise?		☐ Yes	☐ No
What, if any, additional framing did the instructor provide?			
Time participants spent revisiting their initial goal setting activity:			… min
WOOP Exercise			
What format did the instructor use to guide participants through the WOOP exercise?	☐ Played audio recording	☐ Verbally facilitated	☐ None
Total time on WOOP exercise (inclusive of guidance and participant writing):			… min
If the instructor provided verbal guidance, describe below.			
Overall guidance:			
Step-specific guidance:			
W:			
O:			
O:			
P:			
Feedback			
Did the instructor monitor student written responses during the WOOP exercise?		☐ Yes	☐ No
If yes, what verbal or written feedback did the student provide to students?			

Appendix I

Post-Intervention Participant Questionnaire Items

Part I. Your Experience with Goal Setting and WOOP Activities[1]

1. I fully engaged during the WOOP activities that occurred during synchronous sessions in my online class (i.e., I thought through each step of the WOOP cycle and felt interested and engaged in the process)						
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)	☐ N/A (I did not participate in any WOOP activities this term)
2. The wishes I picked during WOOP activities were meaningful and important to me						
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)	☐ N/A (I did not participate in any WOOP activities this term)
3. Revisiting the goals I wrote at the beginning of the term before each WOOP activity was useful						
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)	☐ N/A (I did not participate in any WOOP activities this term)
4. I fully engaged in the initial asynchronous goal setting activity (the one you revisited before each WOOP activity) in my online class (i.e., I thought through each prompt and felt interested and engaged in each step of the WOOP cycle)						
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)	☐ N/A (I did not complete the initial goal setting activity)

5. What were the most useful aspects of the goal setting and WOOP activities? Why?

6. What were the least useful aspects of the goal setting and WOOP activities? Why?

Part II. Time Management Resources

7. Did you engage with any of the resources in *The Together Teacher*?[2]	☐ Yes	☐ No

[1] Part I of the questionnaire will only be included for students in the treated group. Student in untreated class sections will not complete part I because they will not receive the intervention.

[2] *The Together Teacher* is an asynchronous online module available to participants via the institution. It includes resources that may support time management skills (e.g., calendar templates and examples).

8. If you responded yes to item 1, approximately how much of *The Together Teacher* module did you complete?	☐ N/A (none)	☐ Less than half	☐ About half	☐ More than half, but not all	☐ All

9. Did you use any time management resources this semester other than *The Together Teacher* or activities embedded in your coursework (i.e., goal setting and WOOP activities)? If so, what were they and how did you use them?

Part III. Workload[3]

10. Overall, my workload associated with personal responsibilities (e.g., child or elder care, grocery shopping, paying bills, etc.) is manageable.					
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)

11. Overall, my workload at my school is manageable.[4]					
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)

12. Overall, my workload at Relay GSE is manageable. (see Footnote 1)					
☐ Strongly Disagree (1)	☐ Disagree (2)	☐ Somewhat Disagree (3)	☐ Somewhat Agree (4)	☐ Agree (5)	☐ Strongly Agree (6)

[3] Items 11 and 12 shown in this section are included in an existing institutional survey. Data on these items from the institutional survey will be combined with the intervention questionnaire data. The intervention questionnaire will include items 1-4 in this Appendix along with the online learning self-efficacy scale (Zimmerman & Kulikowich, 2016).

[4]The use of the term "school" in item 11 refers to job responsibilities, because all students at the institution are employed at schools.

Appendix J

Characteristics of Participants in Treated and Untreated Groups

Table J1

Comparison of Treated and Untreated Groups – Non-categorical Variables

	Treated Group				Untreated Group				Difference in means significant?	Test Statistics
	Min	Max	*M*	*SD*	Min	Max	*M*	*SD*		
Age	21	54	28.5	8.0	22	63	27.7	7.8	No	U = 2961, p = .940
Undergrad GPA	2.61	4.00	3.37	0.38	2.60	4.11	3.42	0.40	No	U = 2720, p = .409
Pre-intervention time management self-efficacy	1.6	5.6	3.9	0.9	1.8	5.6	4.0	0.9	No	$t(109)$ = 0.6, p = .520

Note. Time management self-efficacy was measured by taking the mean score on the time management subscale of Zimmerman and Kulikowich's (2016) online learning self-efficacy scale. The response options ranged from one to six, with one indicating low self-efficacy and six indicating high self-efficacy.

Table J2

Comparison of Treated and Untreated Groups – Categorical Variables

	Treated Group % (*n*)	Untreated Group % (*n*)	Association with Intervention Significant?	Test Statistics
Year in Grad School: 1	58% (*52*)	27% (*18*)	Yes	X^2 (1, N = 155) = 15.39, p < .001
Year in Grad School: 2	42% (*37*)	73% (*49*)		
Gender: Male	16% (*14*)	27% (*18*)	No	X^2 (1, N = 155) = 3.08, p = .079
Gender: Female	84% (*75*)	73% (*48*)		
Race/Ethnicity: Underrepresented Person of Color	58% (*52*)	46% (*31*)	No	X^2 (1, N = 156) = 2.27, p = .132
Race/Ethnicity: Not an Underrepresented Person of Color	42% (*37*)	54% (*36*)		

Appendix K

Sample Spreadsheet for Participant Completion of an MCII Exercise

Name	Wish	Outcome	Obstacle	Plan	
	What is an important wish that you want to accomplish? Your wish should be challenging but feasible.	What will be the best result from accomplishing your wish? How will you feel? Pause and really imagine the outcome.	What is the main obstacle inside you that might prevent you from accomplishing your wish? Pause and really imagine the obstacle.	What's an effective action to tackle the obstacle? Make a when-then plan.	
	My Wish:	**Best Outcome:**	**My Obstacle:**	**When:**	**Then I will (my plan):**
Example (PK-12)	**Get an A on my math quiz** *(Specific; requires self-control; can be accomplished in time frame)*	**I'll feel proud** *(Fulfilling and motivating; clearly visualized; reduced to most crucial aspects)*	**I procrastinate** *(Inner obstacle, not outside barrier; clearly visualized; reduced to most crucial aspects)*	**I finish dinner** *(Obstacle may arise at this time)*	**Make 5 flashcards** *(Observable action rather than internal decision; student has all resources/skills needed to implement plan)*
[Student Name Here]	I wish that I get an A on my final	Ill feel proud when I turn my final in before schedule	I get anxious about filming	When I need to film	I will film at least twice
[Student Name Here]	Earn an A on my final	That my Act one video was not as bad as i thought .	In submitting my assignments (videos) because I always say i'll redo it and never do.	When I feel my assignment is not the best quality.....	Ask for feedback before submitting. That way I can receive feedback and make the necessary changes to get the grade I need to pass this class.
[Student Name Here]				When...[describe your obstacle arising]	
[Student Name Here]				When...[describe your obstacle arising]	
[Student Name Here]				When...[describe your obstacle arising]	

Notes:

- The top of the table includes directions for each step, as well as an example of each step
- These directions, as well as the example, are taken directly from the Character Lab (2019) materials, although they have been reformatted
- The first two lines of student responses are actual participant responses from one round of MCII in one class section
- The second two lines for student responses show what the spreadsheet looked like for participant before they began writing in it

Appendix L

All Codes used for MCII Observational Data

Code	Definition	Example from Observation Notes
	Quality of Delivery Indicators	
Audio Script	Facilitator plays the facilitation audio	While I load up the audio, start thinking about a wish
Goals	Facilitator frames activity in achievement of goal(s)	WOOP is an activity designed to help you spend your time in a way aligned to your goals
Example	Facilitator references the example in the participant materials, which participants can use as a guide	Verbally directed student attention to the example line (your personal example will be different)
Feasible	Facilitator guides participants to write achievable wishes	Something you can accomplish in 2-4 weeks.
Focus	Facilitator guides participants to write a wish related to online coursework in some way	As much as possible, think about goals for this class. Strong targeted goals that relate to the work we're currently doing.
Read Script	Facilitator reads the facilitation script provided aloud	Reads facilitation script.
Specific	Facilitator guides participants to write specific wishes	Try to be as specific as you can.
	Facilitation Issues	
Direction	Facilitator gives a direction that could cause a fidelity issue	Student question: Any sort of wish? Response: Anything important to you and it should be difficult but achievable. [Should have directed students to think about something @ Relay]. Several students pick things unrelated to time management @ Relay (ex: visit specific country, exercise, etc.)

Code	Definition	Example from Observation Notes
Link	Link to facilitation script broken	Private chats me that link on character lab website for facilitation guide is broken; I check and it is. I can't fix b/c it's the researcher's site, so I tell her to use the prompts in row 2 of the spreadsheet
Materials	Facilitation materials could cause confusion	Audio says IF then plan, but written directions are formatted as WHEN then plans. Students do not seem to be tripped up, but I should have probably formatted as if… to begin with.
Student Tech	Student(s) have technology issues that prevent them from fully participating	Student has trouble finding her name (she's likely on overview tab not 10/23 tab). Instructor directs her to the bottom of the page. Student is still confused. Repeats direction. Different student: Mine is still loading. Instructor directs her to link in chatbox. First student: my thing has frozen. Prof gives feedback. Initial student shares again that she can't find. Prof directs
Timing	Facilitator moves on before all participants have completed a step	Advances slide while a couple are still typing – they probably had something in the last box but didn't hit enter so it won't have been recorded.
Working Ahead	Participants write in step(s) before the facilitator gives directions for the step(s) in question	Students actively writing in the tab during the audio even ahead a step (e.g., writing outcome during wish narration in audio).
	Logistical Supports	
Organization	Facilitator gives a direction to help participants navigate materials	"When you have that feeling in mind, please write it in the box next to your wish"
Timing Check	Facilitator checks on participant progress	Thumbs up when you're ready to move on
Timing Direction	Facilitator gives a direction about the time for the activity or its components	"Take another minute and wrap up what your thoughts are for your plan"

ALICE WALDRON

EDUCATION

Ed.D., Johns Hopkins University, Baltimore, MD 2020
Course Specialization: Technology Integration in Education
Dissertation: Time Management in Online Higher Education Courses

M.S.T., Pace University, New York, NY 2007

B.A., Pomona College, Claremont, CA 2005
Bachelor's Thesis: Geophysical Analyses of Cyclone Graben, Canyonlands National Park, Utah

AWARDS

ETS Recognition of Excellence for General Science: Content Knowledge	2011
Elected Member, Phi Beta Kappa	2005
The John Stauffer Prize for Academic Merit in the Sciences	2005
The Donald B. McIntyre-H. Stanton Hill Award in Geology	2005
Elected Member, Sigma Xi	2004
Barry M. Goldwater Scholarship	2004
The Isabel F. Smith Award in Geology	2004
Pomona College Scholar	2001-2005

LEADERSHIP AND CURRICULUM DESIGN EXPERIENCE

Relay Graduate School of Education, New York, NY 2017-present
Dean, Online Instruction

Relay Graduate School of Education, New York, NY 2013-2017
Director of Content Curriculum Design

Relay Graduate School of Education, New York, NY 2012-2013
Science Curriculum Designer

Teach For America, New York, NY 2009-2012
Director of Design

Teach For America, Denver, CO 2007-2009
Program Director

TEACHING EXPERIENCE

Relay Graduate School of Education, New York, NY — 2012-present
Assistant Professor of Practice

Pace University, New York, NY — 2006-2007
Adjunct Instructor, Secondary Science

Middle School 821 (Sunset Park Prep), Brooklyn, NY — 2005-2007
7th and 8th Grade Science Teacher

American Museum of Natural History, New York, NY — 2006
Instructor, Hayden Astrophysics Outreach Program

Pomona College, Claremont, CA — 2003-2004
Teaching Assistant, *Introductory Geology*

Student Health and Wellness Centers Organization, Cape Town, South Africa — 2004
Instructor, After School Art Program